RS100-E6/PI2

1U Rackmount Server

User Guide

E5109

First Edition
November 2009

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Contents

Contents ..... **iii**
Notices ..... **vii**
Safety information ..... **viii**
About this guide ..... **ix**

Chapter 1: Product introduction

1.1 System package contents **1-2**
1.2 Serial number label **1-2**
1.3 System specifications **1-3**
1.4 Front panel features **1-5**
1.5 Rear panel features **1-5**
1.6 Internal features **1-6**
1.7 LED information **1-7**
1.7.1 Front panel LEDs 1-7
1.7.2 LAN (RJ-45) LEDs 1-7

Chapter 2: Hardware setup

2.1 Chassis cover **2-2**
2.1.1 Removing the chassis cover 2-2
2.1.2 Reinstalling the chassis cover 2-3
2.2 Central Processing Unit (CPU) **2-5**
2.2.1 Installing the CPU 2-5
2.2.2 Installing the CPU heatsink and airduct 2-8
2.3 System memory **2-10**
2.3.1 Overview 2-10
2.3.2 Memory Configurations 2-10
2.3.3 Installing a DIMM 2-11
2.3.4 Removing a DIMM 2-11
2.4 Hard disk drives **2-12**
2.4.1 Installing a hard disk drive to the HDD tray 1 2-12
2.4.2 Installing a hard disk drive to the HDD tray 2 2-13
2.5 Expansion card **2-15**
2.5.1 Installing an expansion card 2-15
2.5.2 Configuring an expansion card 2-17
2.6 Cable connections **2-18**
2.7 Removable/optional components **2-19**
2.7.1 System fans 2-19

Contents

2.7.2 Optical disk drive (ODD) 2-20
2.7.3 Installing ASMB4 series management board (optional)... 2-22

Chapter 3: Rackmount installation

3.1 Rackmount rail kit items..... 3-2
3.2 Attaching the rack ears 3-2
3.3 Attaching the rails to the rack..... 3-3

Chapter 4: Motherboard Info

4.1 Motherboard layout..... 4-2
4.2 Jumpers 4-4
4.3 Internal connectors..... 4-8

Chapter 5: BIOS setup

5.1 Managing and updating your BIOS 5-2
5.1.1 ASUS EZ Flash 2 utility..... 5-2
5.1.2 BUPDATER utility..... 5-3
5.1.3 ASUS CrashFree BIOS 3 utility 5-5
5.2 BIOS setup program 5-6
5.2.1 BIOS menu screen..... 5-7
5.2.2 Menu bar..... 5-7
5.2.3 Navigation keys..... 5-7
5.2.4 Menu items 5-8
5.2.5 Sub-menu items..... 5-8
5.2.6 Configuration fields 5-8
5.2.7 Pop-up window 5-8
5.2.8 Scroll bar..... 5-8
5.2.9 General help 5-8
5.3 Main menu 5-9
5.3.1 System Time [xx:xx:xx] 5-9
5.3.2 System Date [Day xx/xx/xxxx]..... 5-9
5.3.3 SATA1—6..... 5-9
5.3.4 Storage Configuration 5-11
5.3.5 AHCI Configuration 5-12
5.3.6 System Information 5-13
5.4 Advanced menu 5-14
5.4.1 CPU Configuration 5-14

Contents

5.4.2 Chipset 5-18
5.4.3 Onboard Devices Configuration 5-20
5.4.4 USB Configuration 5-21
5.4.5 PCIPnP 5-22
5.4.6 ACPI Configuration 5-23
5.4.7 Event Log Configuration 5-25
5.4.8 Intel VT-d Configuration [Disabled] 5-25
5.4.9 SR-IOV Supprted [Disabled] 5-25

5.5 Server menu 5-26

5.6 Power menu 5-28

5.6.1 APM Configuration 5-28
5.6.2 Hardware Monitor 5-30

5.7 Boot menu 5-31

5.7.1 Boot Device Priority 5-31
5.7.2 Hard Disk Drives; CDROM Drives 5-31
5.7.3 Boot Settings Configuration 5-32
5.7.4 Security 5-33

5.8 Tools menu 5-35

5.8.1 ASUS EZ Flash 2 5-35

5.9 Exit menu 5-36

Chapter 6: RAID configuration

6.1 Setting up RAID 6-2

6.1.1 RAID definitions 6-2
6.1.2 Installing hard disk drives 6-2
6.1.3 RAID controller selection 6-3
6.1.4 Setting the RAID item in BIOS 6-3

6.2 LSI Software RAID Configuration Utility 6-4

6.2.1 Creating a RAID set 6-5
6.2.2 Adding or viewing a RAID configuration 6-11
6.2.3 Initializing the virtual drives 6-12
6.2.4 Rebuilding failed drives 6-16
6.2.5 Checking the drives for data consistency 6-18
6.2.6 Deleting a RAID configuration 6-21
6.2.7 Selecting the boot drive from a RAID set 6-22
6.2.8 Enabling WriteCache 6-23

Contents

6.3 Intel® Matrix Storage Manager Option ROM Utility 6-24

6.3.1 Creating a RAID set 6-25

6.3.2 Creating a Recovery set 6-26

6.3.3 Deleting a RAID set 6-28

6.3.4 Resetting disks to Non-RAID 6-29

6.3.5 Recovery Volume Options 6-30

6.3.6 Exiting the Intel® Matrix Storage Manager 6-31

6.3.7 Rebuilding the RAID 6-31

6.3.8 Setting the Boot array in the BIOS Setup Utility..... 6-33

Chapter 7: Driver installation

7.1 RAID driver installation 7-2

7.1.1 Creating a RAID driver disk 7-2

7.1.2 Installing the RAID controller driver 7-5

7.2 Intel® chipset device installation 7-17

7.3 LAN driver installation..... 7-19

7.4 VGA driver installation..... 7-22

7.5 Management applications and utilities installation 7-24

7.5.1 Running the support DVD 7-24

7.5.2 Drivers menu..... 7-24

7.5.3 Utilities menu 7-25

7.5.4 Make disk menu..... 7-25

7.5.5 Contact information..... 7-25

Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING! The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This Class B digital apparatus complies with Canadian ICES-003.

REACH

Complying with the REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulatory framework, we publish the chemical substances in our products at ASUS REACH website at http://green.asus.com/english/REACH.htm.

Safety information

Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing any additional devices to or from the system, contact a qualified service technician or your dealer. Ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you service.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

Operation Safety

- Servicing of this product or units is to be performed by trained service personnel only.
- Before operating the server, carefully read all the manuals included with the server package.
- Before using the server, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Place the server on a stable surface.

This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

Lithium-Ion Battery Warning

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

CD-ROM Drive Safety Warning

CLASS 1 LASER PRODUCT

Heavy System

CAUTION! This server system is heavy. Ask for assistance when moving or carrying the system.

DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

About this guide

Audience

This user guide is intended for system integrators, and experienced users with at least basic knowledge of configuring a server.

Contents

This guide contains the following parts:

1. **Chapter 1: Product Introduction**

   This chapter describes the general features of the server, including sections on front panel and rear panel specifications.

2. **Chapter 2: Hardware setup**

   This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

3. **Chapter 3: Rackmount installation**

   This chapter describes how to install the rackmount rail kit to the barebone server

4. **Chapter 4: Motherboard information**

   This chapter includes the motherboard layout and brief descriptions of the jumpers and internal connectors.

5. **Chapter 5: BIOS information**

   This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

6. **Chapter 6: RAID configuration**

   This chapter provides instructions for setting up, creating and configuring RAID sets using the available utilities.

7 **Chapter 7: Driver installation**

   This chapter provides instructions for installing the necessary drivers for different system components.

Conventions

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. Example: <Enter> means that you must press the Enter or Return key.
<Key1+Key2+Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: <Ctrl+Alt+D>
`Command`	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets. Example: At the DOS prompt, type the command line: **`format A:/S`**

References

Refer to the following sources for additional information, and for product and software updates.

1. **ASUS Server Web-based Management (ASWM) user guide**

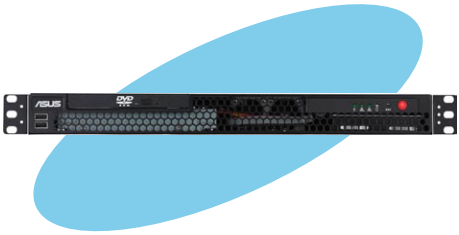
   This manual tells how to set up and use the proprietary ASUS server management utility.

2. **ASUS websites**

   The ASUS websites worldwide provide updated information for all ASUS hardware and software products. Refer to the ASUS contact information.

Chapter 1

This chapter describes the general features of the server, including sections on front panel and rear panel specifications.



Product introduction

1.1 System package contents

Check your system package for the following items.

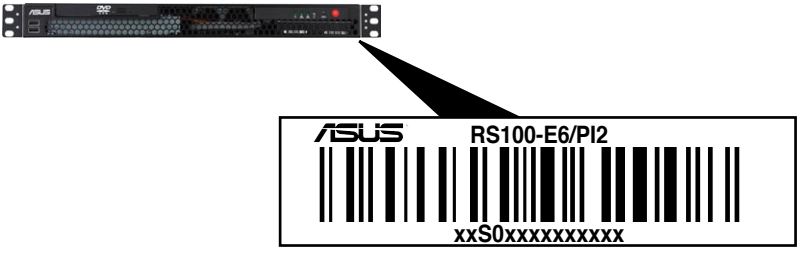
Model Name	RS100-E6/PI2
Chassis	ASUS R09 1U Rackmount Chassis
Motherboard	ASUS P7F-M Server Board
Component	1 x 220W Single Power Supply 2 x SATA Cables 1 x PCI Express x16 Riser Card (PCIE16-R11) 1 x Front I/O Board (FPB-R9) 1 x USB Board (USB-R9) 2 x System Fans (40mm x 28mm)
Accessories	1 x RS100-E6/PI2 User's Guide 1 x ASUS ASWM 2.0 User's Guide 1 x RS100-E6/PI2 Support CD (including ASWM*) 1 x Bag of Screws 1 x AC Power Cable
Optional Items	CPU Heatsink Riser Card: PCI 32bit/33MHz (R133-R9A) ASUS ASMB4-iKVM Remote management card Slim-type Optical Device Ball Bearing Rail Kit CA eTrust Anti-virus Software CD

***ASUS System Web-based Management**

If any of the above items is damaged or missing, contact your retailer.

1.2 Serial number label

Before requesting support from the ASUS Technical Support team, you must take note of the product's serial number containing 14 characters such as xxS0xxxxxxxxxx shown as the figure below. With the correct serial number of the product, ASUS Technical Support team members can then offer a quicker and satisfying solution to your problems.



1.3 System specifications

The ASUS RS100-E6/PI2 is a 1U barebone server system featuring the ASUS P7F-M server board. The server supports Intel® LGA1156 Lynnfield / Clarkdale processors, plus other latest technologies through the chipsets onboard.

Model Name		RS100-E6/PI2
Processor / System Bus		1 x Socket LGA1156 Quad Core Intel® Xeon 3400 series Server Processor Quad Core Intel® Core i7-800 series Desktop Processor Quad Core Intel® Core i5-700 series Desktop Processor Dual Core Clarkdale CPU design Ready
Core Logic		Intel® 3420 PCH
ASUS Features	Smart Fan	√
	ASWM2.0	√
Memory	Total Slots	4 (2 Channels)
	Capacity	Maximum up to 32GB (RDIMM) Maximum up to 16GB (UDIMM) Desktop Processor do not support RDIMM nor ECC UDIMM
	Memory Type	DDR3 1333 / 1066 Registered / Unbuffered DIMM with ECC / Non ECC
	Memory Size	1 GB, 2GB, 4GB, 8GB (RDIMM) 1 GB, 2GB, 4GB (UDIMM)
Expansion Slots	Total PCI/PCI-X/ PCI-E Slots	1
	Slot Type	1 x PCI-E 2.0 x16 slot (x16 link) (Full-Height/HL)
Storage		2 x SATA2 300MB/s ports Intel® Matrix Storage (for Windows only) - Supports software RAID 0 & 1 LSI® MegaRAID (for Linux / Windows) - Supports software RAID 0 & 1
HDD Bays	I = internal A or S = hot-swappable	2 x Internal 3.5” SATA2 HDD Bays
Networking	LAN	2 x Intel® 82574L + 1 x Mgmt LAN
Graphic	VGA	Aspeed® AST2050 8MB
Auxiliary Storage FDD / CD / DVD		1 x Slim-type Optical Device Bay (Options: No ODD / DVD-ROM / DVD-RW)
Onboard I/O		1 x External Serial Port 3 x RJ-45 ports (1 for ASMB4-iKVM) 4 x USB 2.0 ports (Front x 2, Rear x 2) 1 x VGA port 1 x PS/2 keyboard port 1 x PS/2 mouse port

(continued on the next page)

OS Support		Windows® Server 2008 Enterprise 32 / 64-bit Windows® Server 2003 R2 Enterprise 32 / 64-bit RedHat® Enterprise Linux AS5.0 32 / 64-bit SuSE® Linux Enterprise Server 10 32 / 64-bit (Subject to change without any notice)
Anti-virus Software		Optional anti-virus CD Pack
Management Solution	**Out of Band Remote Hardware**	Optional ASMB4-iKVM for KVM-over-IP support
	Software	ASUS ASWM 2.0®
Net Weight Kg (CPU, DRAM & HDD not inclu ded)		6.5 Kg
Dimension (DD x WW x HH)		380mm x 429.6mm x 43.2mm
Power Supply		220W Single Power Supply
Power Rating		Input: 100-240Vac, 4-2A, 50-60Hz, Class I
Environment		Operation temperature: 10°C–35°C / Non operation temperature: -40°C–70°C Non operation humidity: 20%–90% (Non-condensing)

***Specifications are subject to change without notice.**

1.4 Front panel features

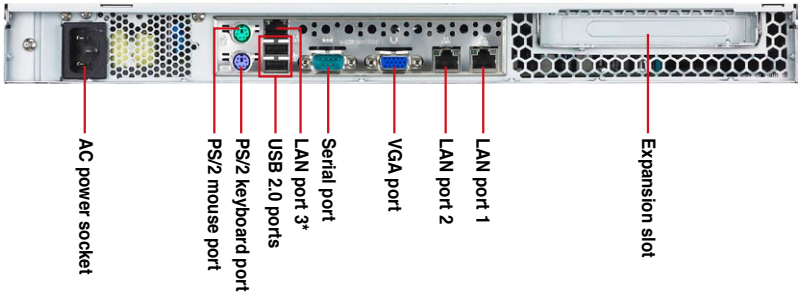
The barebone server displays a simple yet stylish front panel with easily accessible features. The power and reset buttons, LED indicators, optical drive, and twp USB ports are located on the front panel.

Refer to section **1.7.1 Front panel LEDs** for the LED descriptions.

Turn off the system power and detach the power supply before removing or replacing any system component.

1.5 Rear panel features

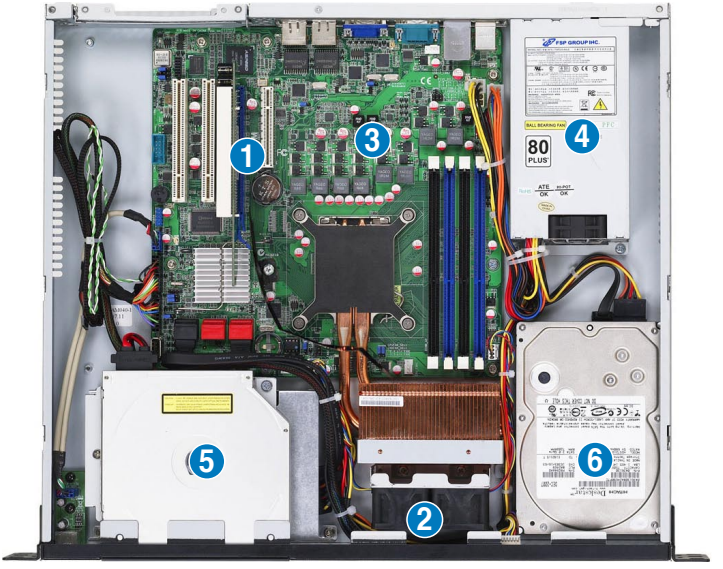
The rear panel includes the expansion slot and system power socket. The I/O shield with openings for the rear panel connectors on the motherboard are also placed in the rear panel.



- The ports for the PS/2 keyboard, PS/2 mouse, USB, VGA, and Gigabit LAN do not appear on the rear panel if motherboard is not present.
- *The port is for ASUS ASMB4-iKVM controller card only.

1.6 Internal features

The barebone server includes the basic components as shown.



1. PCI Express x16 Riser Card (at x16 link)
2. System Fan (x2) (9GV0412P3J051)
3. ASUS P7F-M Server Board
4. Power Supply
5. HDD Tray 2 (hidden) and Slim-type Optical Drive (optional)
6. HDD Tray 1

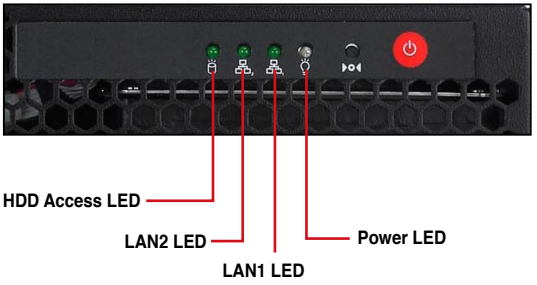
Turn off the system power and detach the power supply before removing or replacing any system component.

The barebone server does not include a floppy disk drive. Connect a USB floppy disk drive to any of the USB ports on the front or rear panel if you need to use a floppy disk.

*WARNING
HAZARDOUS MOVING PARTS
KEEP FINGERS AND OTHER BODY PARTS AWAY

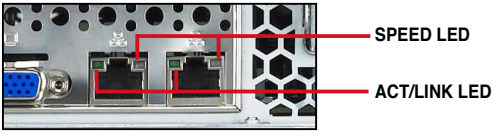
1.7 LED information

1.7.1 Front panel LEDs



LED	Icon	Display status	Description
Power LED		ON	System power ON
HDD Access LED		OFF Blinking	No activity Read/write data into the HDD
LAN LEDs		OFF Blinking ON	No LAN connection LAN is transmitting or receiving data LAN connection is present

1.7.2 LAN (RJ-45) LEDs



ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

Chapter 2

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

Hardware setup

2.1 Chassis cover

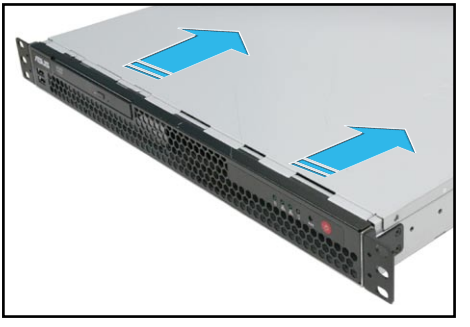
2.1.1 Removing the chassis cover

- Ensure that you unplug the power cord before removing the chassis cover.
- Take extra care when removing the chassis cover. Keep your fingers from components inside the chassis that can cause injury, such as the CPU fan, rear fan, and other sharp-edged parts.
- The images of the barebone server shown in this section are for reference purposes only and may not exactly match the model you purchase.

To remove the chassis cover:

1. Use a Phillips screwdriver to remove the three screws on the chassis cover.

2. Firmly hold the cover and slide it toward the rear panel for about half an inch until it is disengaged from the chassis.

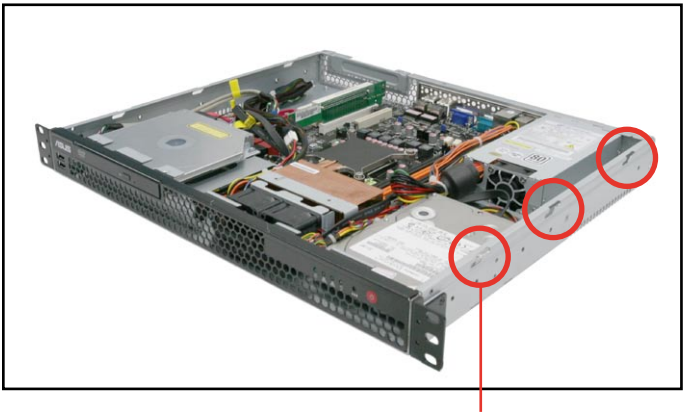


3. Lift the cover from the chassis.

2.1.2 Reinstalling the chassis cover

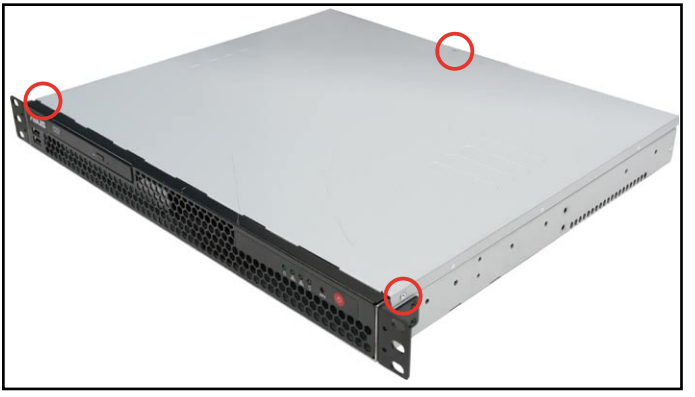
To reinstall the chassis cover:

1. Position the cover on top of the chassis with the hooks aligned to the side tabs of the chassis.



2. Slide the cover toward the front until it snaps in place.

3. Secure the cover with three screws.



2.2 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA 1156 Socket designed for the Intel® Lynnfield / Clarkdale series processors.

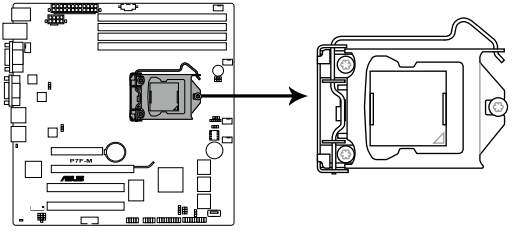
Ensure that all power cables are unplugged before installing the CPU.

- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS shoulders the repair cost only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1156 socket.
- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/ incorrect removal of the PnP cap.

2.2.1 Installing the CPU

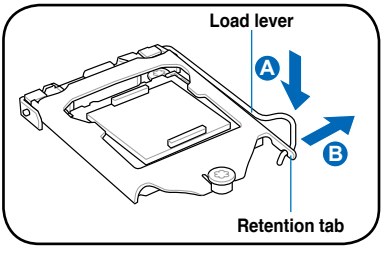
To install a CPU:

1. Locate the CPU socket on the motherboard.



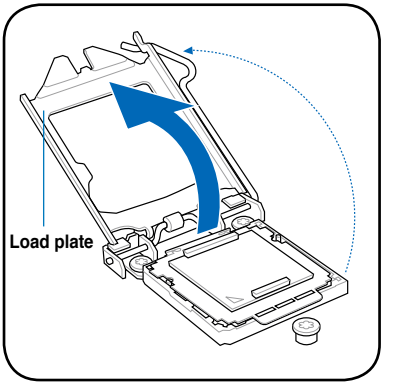
P7F-M CPU LGA1156

2. Press the load lever with your thumb (A), and then move it to the right (B) until it is released from the retention tab.

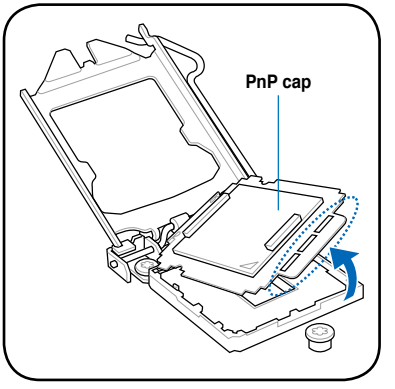


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

3. Lift the load lever in the direction of the arrow until the load plate is completely lifted.

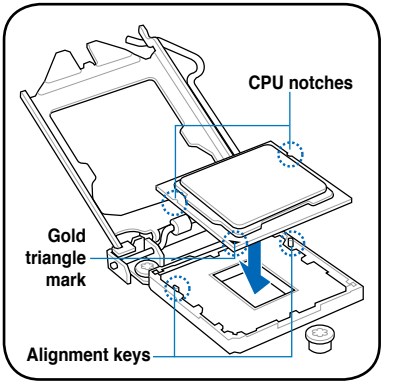


4. Remove the PnP cap from the CPU socket.

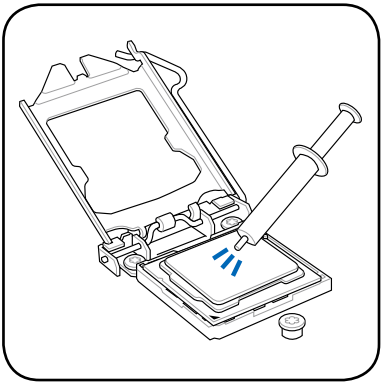


5. Position the CPU over the socket, ensuring that the gold triangle is on the bottom-left corner of the socket, and then fit the socket alignment keys into the CPU notches.

The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!



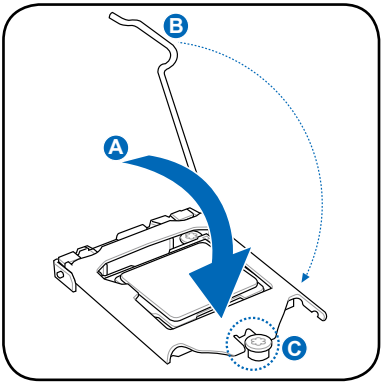
6. Apply some Thermal Interface Material to the exposed area of the CPU that the heatsink will be in contact with, ensuring that it is spread in an even thin layer.



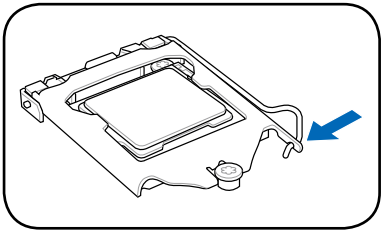
Some heatsinks come with pre-applied thermal paste. If so, skip this step.

The Thermal Interface Material is toxic and inedible. DO NOT eat it. If it gets into your eyes or touches your skin, wash it off immediately, and seek professional medical help.

7. Close the load plate (A), and then push down the load lever (B), ensuring that the front edge of the load plate slides under the retention lock (C).



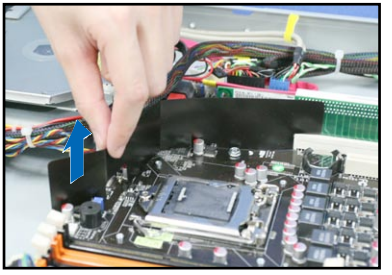
8. Insert the load lever under the retention tab.



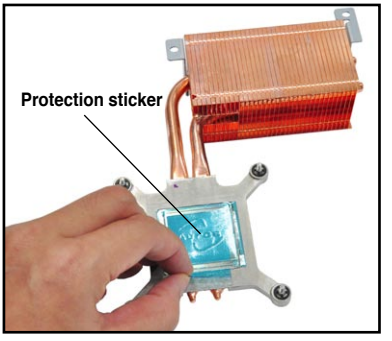
2.2.2 Installing the CPU heatsink and airduct

To install the CPU heatsink:

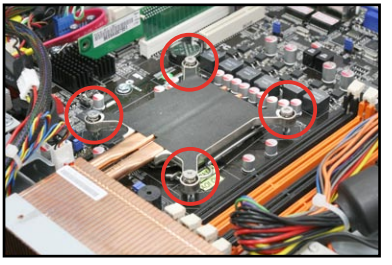
1. Lift one side of the mylar and set it aside for installing the CPU heatsink.



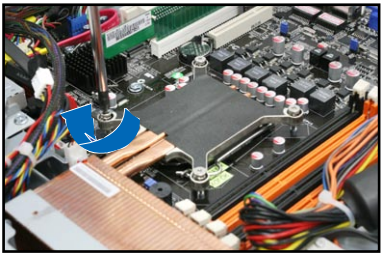
2. Remove the protection sticker on the back of the CPU heatsink.

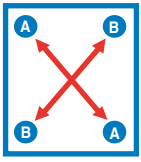


3. Place the heatsink on top of the installed CPU, ensuring that the four fasteners match the holes on the motherboard.



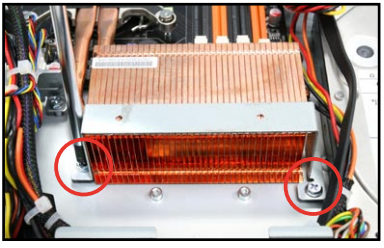
4. Twist each of the four screws with a Philips (cross) screwdriver just enough to attach the heatsink to the motherboard. When the four screws are attached, tighten them one by one to completely secure the heatsink.



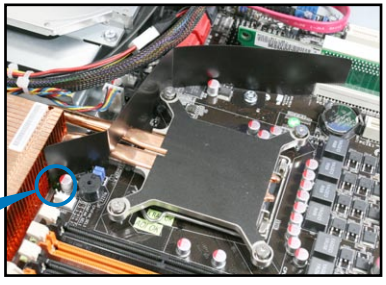


Tighten the four heatsink screws in a diagonal sequence.

5. Secure the heat pipe and air duct to the server with two screws.



6. Set the mylar back to its original place. When the mylar is properly installed, the hook as shown below should attach the motherboard edge.



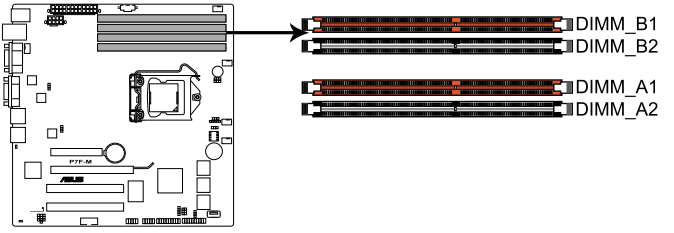
Ensure that the mylar does not interfere any motherboard headers or capacitors.

2.3 System memory

2.3.1 Overview

The motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Modules (DIMM) sockets.

The figure illustrates the location of the DDR3 DIMM sockets:



P7F-M 240-pin DDR3 DIMM sockets

2.3.2 Memory Configurations

You may install 1 GB, 2 GB, 4 GB, 8 GB Registerd, or 1 GB, 2 GB, 4 GB Unbuffered with ECC/Non-ECC DDR3 DIMMs into the DIMM sockets using the memory configurations in this section.

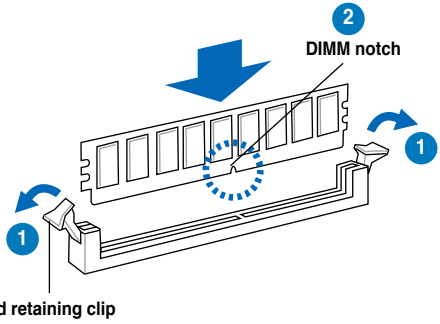
UDIMM				
DIMM Slot Per Channel	DIMM Populated per Channel	DIMM Type	Speed	Rank per DIMM
2	1	Unbuffered DDR3	1333	Single Rank, Dual Rank
2	2	Unbuffered DDR3	1333	Single Rank, Dual Rank

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- The motherboard supports x8 DRAM only and x4 & x16 DRAM are not supported

2.3.3 Installing a DIMM

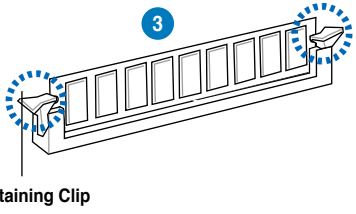
Ensure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

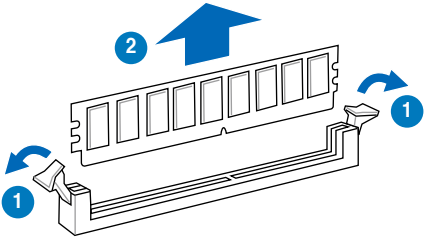
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



2.3.4 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.



Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

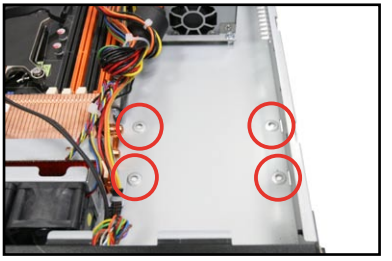
2.4 Hard disk drives

You can install up to two (2) Serial ATA hard disk drives to the system. Follow the succeeding instructions to install each of the drives.

2.4.1 Installing a hard disk drive to the HDD tray 1

To install a hard disk drive to the HDD tray 1:

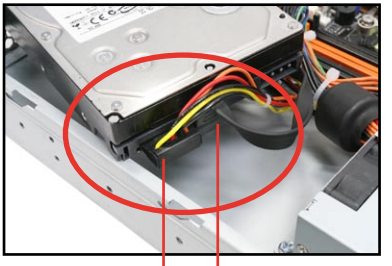
1. Locate the HDD tray 1 beside the power supply unit. Notice the four standard screw holes.



2. Connect the SATA signal cable and a power plug from the power supply to the hard disk drive.

Use the L-type SATA connector to connect to the hard disk drive.

L-type SATA connector

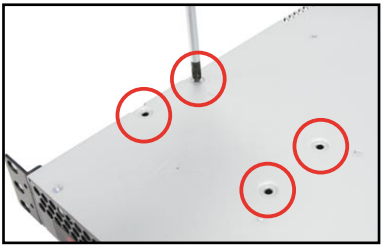


Power plug

SATA signal cable

3. Place the hard disk drive into the HDD tray 1 matching the four screw holes with the holes on the disk drive.

4. Secure the hard disk drive with four screws.

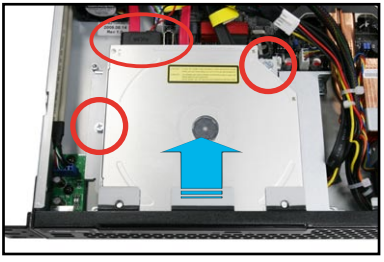


2.4.2 Installing a hard disk drive to the HDD tray 2

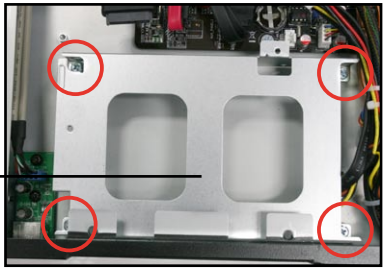
To install a hard disk drive to the HDD tray 2:

1. If you have an ODD installed, remove the ODD first before installing a hard disk drive to the HDD tray 2.

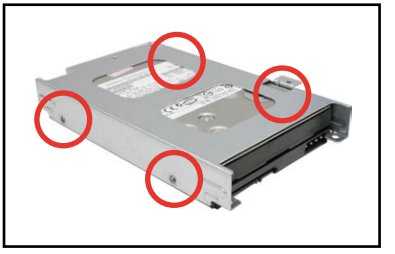
   Disconnect the ODD cable, and then use a screwdriver to remove the two screws as shown.



2. Remove the four screws to release the HDD bracket under the optical disk drive.



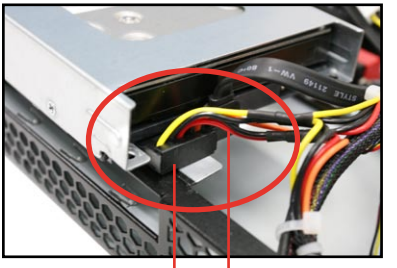
3. Insert the hard disk drive into the HDD bracket and secure it with four screws.



4. Connect the SATA signal cable and a power plug from the power supply to the hard disk drive.

Use the L-type SATA connector to connect to the hard disk drive.

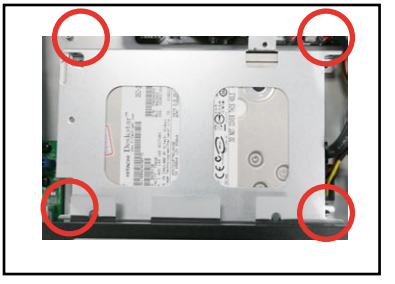
L-type SATA connector



Power plug

SATA signal cable

5. Place the HDD bracket with the hard disk drive installed into the HDD tray 2, matching the four screw holes. Then, secure the HDD bracket with four screws.



6. Refer to section **2.7.2 Optical disk drive (ODD)** to reinstall the ODD.

2.5 Expansion card

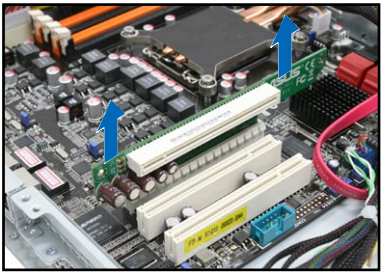
The system comes with a riser card. You need to remove the riser card and the expansion slot bracket if you want to install an expansion card.

Ensure to unplug the power cord before installing or removing an expansion card. Failure to do so may cause severe damage to the motherboard and other system components!

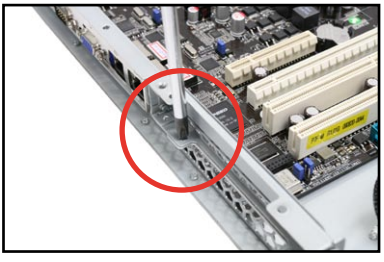
2.5.1 Installing an expansion card

To install an expansion card:

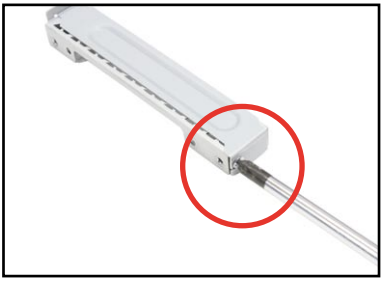
1. Hold the riser card and pull it up to detach it from the PCI Express slot on the motherboard.



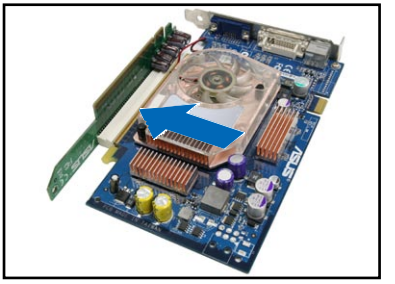
2. Remove the screw to release the expansion card bracket from the system.



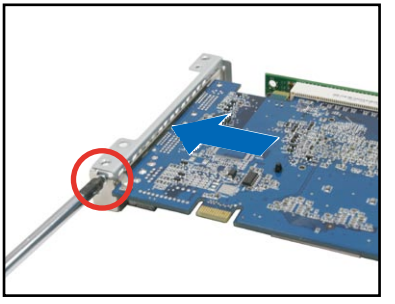
3. Remove the screw to release the metal slot cover from the expansion card bracket.



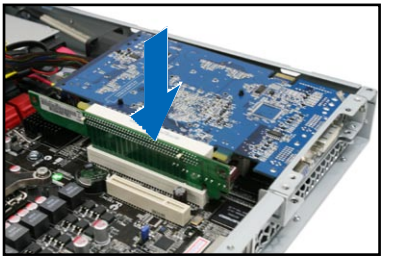
4. Install the expansion card to the riser card as shown.



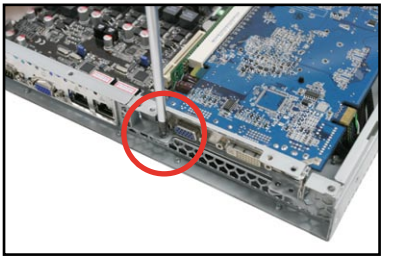
5. Attach the expansion card to the expansion card bracket, and then secure the card with a screw.



6. Align the riser card with the expansion card installed to the PCI Express slot on the motherboard.
7. Press the riser card until the golden connectors completely fit the slot and the bracket aligns with the rear panel.



8. Secure the expansion card bracket to the system with one screw.



2.5.2 Configuring an expansion card

After installing the expansion card, configure the it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the following tables.
3. Install the software drivers for the expansion card.

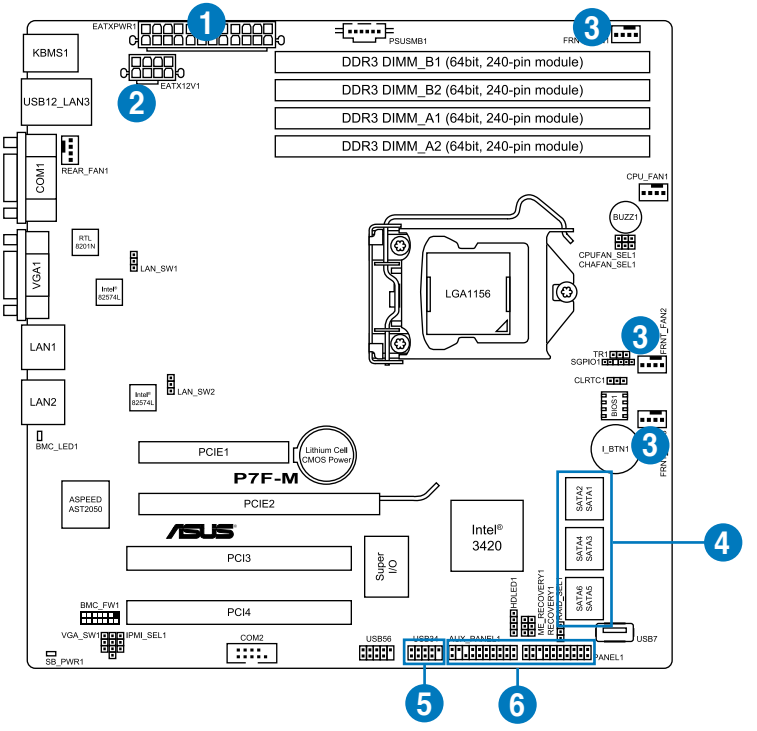
Standard Interrupt assignments

IRQ	Priority	Standard function
0	1	System Timer
1	2	Keyboard Controller
2	-	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	--
6	14	Floppy Disk Controller
7*	15	--
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

*** These IRQs are usually available for ISA or PCI devices.**

2.6 Cable connections

- The bundled system cables are pre-connected before shipment. You do not need to disconnect these cables unless you will remove pre-installed components to install additional devices.
- Refer to Chapter 4 for detailed information on the connectors.



Standard cables connected to the motherboard

1. 24-pin ATX power connector (from power supply to motherboard)
2. 8-pin ATX 12V power connector (from power supply to motherboard)
3. System fan connector (from system fan to motherboard)
4. SATA conectors (system default; from motherboard to SATA devices)
5. USB connector (from motherboard to front I/O board)
6. System panel connectors (from motherboard to front I/O board)

2.7 Removable/optional components

You may need to remove previously installed system components when installing or removing system devices. Or you may need to install the optional components into the system. This section tells how to remove/install the following components:

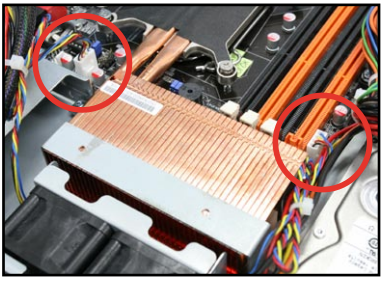
1. System fans
2. Optical disk drive (optional)
3. ASUS ASMB4-iKVM (optional)

Ensure that the system is turned off before removing any components.

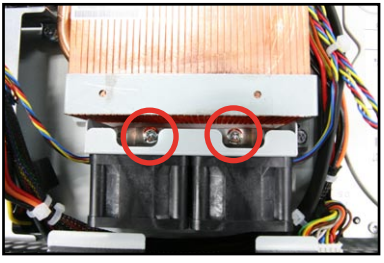
2.7.1 System fans

To remove the system fan:

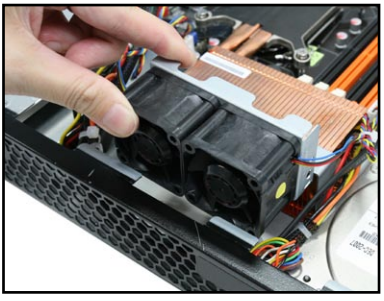
1. Unplug the system fan cables from the FRNT_FAN1 and FRNT_FAN2 connectors on the motherboard.



2. Locate and remove the two system fan screws. Keep the screws for late use.



3. Remove the system fans, and then set them aside.

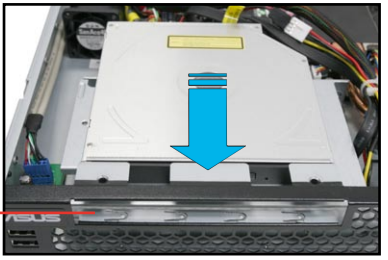


Follow the previous instructions in reverse if you want to reinstall the system fans.

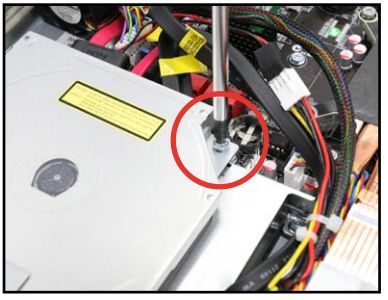
2.7.2 Optical disk drive (ODD)

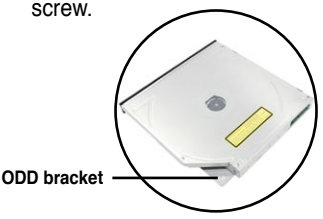
To install the optical disk drive:

1. Slide in the optical disk drive into the drive slot as shown.



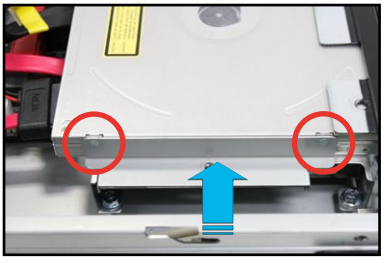
2. Align the screw hole of the ODD bracket with the one on the HDD bracket, and then secure it with a screw.

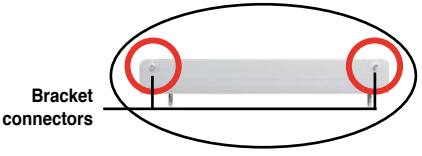




Optical disk drive (optional)

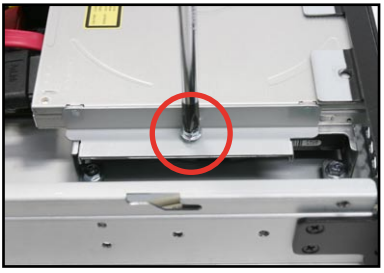
3. Attach the ODD side bracket to the ODD, matching the two connectors of the bracket with the holes on the side of the ODD.



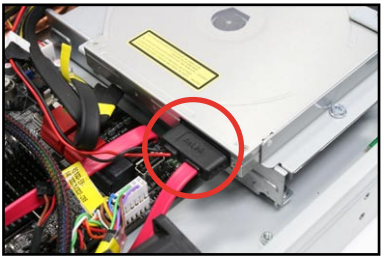


ODD side bracket

4. Secure the ODD side bracket to the HDD bracket with a screw.



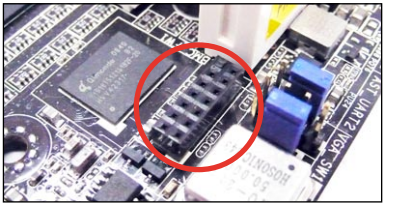
5. Connect the ODD cable to the optical disk drive.



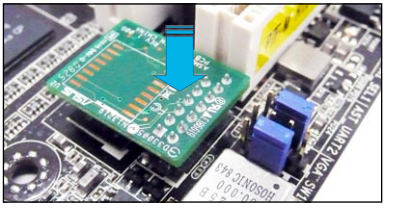
2.7.3 Installing ASMB4 series management board (optional)

Follow the steps below to install an optional ASMB4 series management board on your motherboard.

1. Locate the BMC_FW1 header on the motherboard.



2. Orient and press the ASMB4 management card in place.



3. Insert the LAN cable plug to the LAN port 3 (dedicated LAN) or LAN port 1 (shared LAN) for server management.

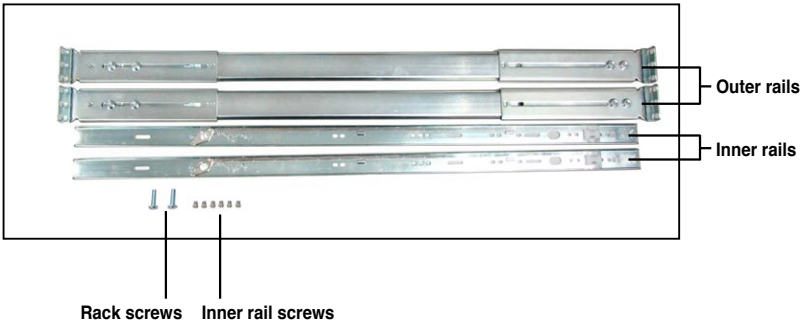
Chapter 3

This chapter describes how to install the rackmount rail kit to the barebone server.

Rackmount installation

3.1 Rackmount rail kit items

The rackmount rail kit contains two pairs of rails (one pair for each side of the server system), six (6) pieces of inner rail screws, and two (2) pieces of rack screws.

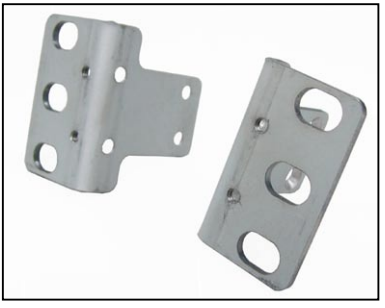


3.2 Attaching the rack ears

The bundled rack ears serve as handle when inserting or pulling the server from a rack cabinet.

To attach rack ears:

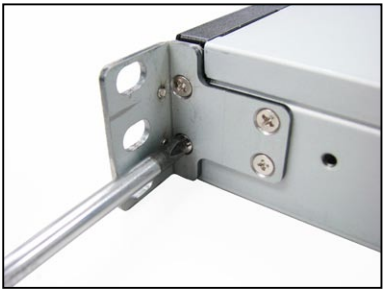
1. Prepare the bundled pair of rack ears and set of eight (8) screws.



Pair of rack ears

2. Locate the four screw holes on each front-side of the chassis. Select one side for installation.

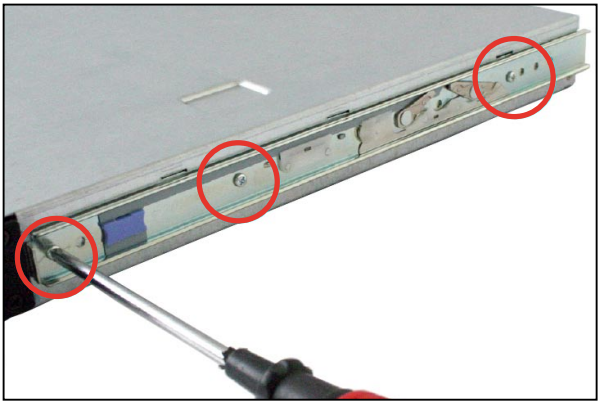
3. Get one rack ear and match the four screw holes to the screw holes on the chassis. Orient the rack ear as shown.
4. Secure the rack ear to the chassis with four screws.
5. Repeat steps 2 - 4 to attach the other rack ear.



3.3 Attaching the rails to the rack

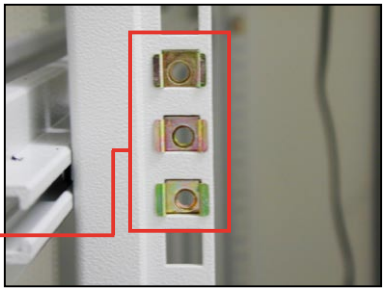
To attach the rack rails:

1. Attach the inner rail to the correspoding side of the chassis and secure with three inner rail screws. Make sure the rail is oriented as shown.

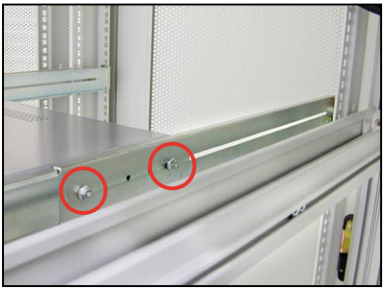


2. Attach the second inner rail to the other side of the chassis and secure with three inner rail screws.

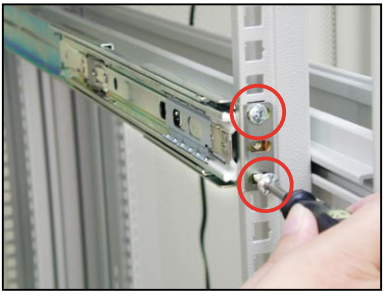
3. Select one unit of space (1U) on the rack where you wish to install the server.
4. Place three (3) nuts on the front and three at the back. Do the same to the corresponding side of the rack.



5. Adjust the length of the outer rail to fit the length of the rack cabinet, then fasten the two screws.

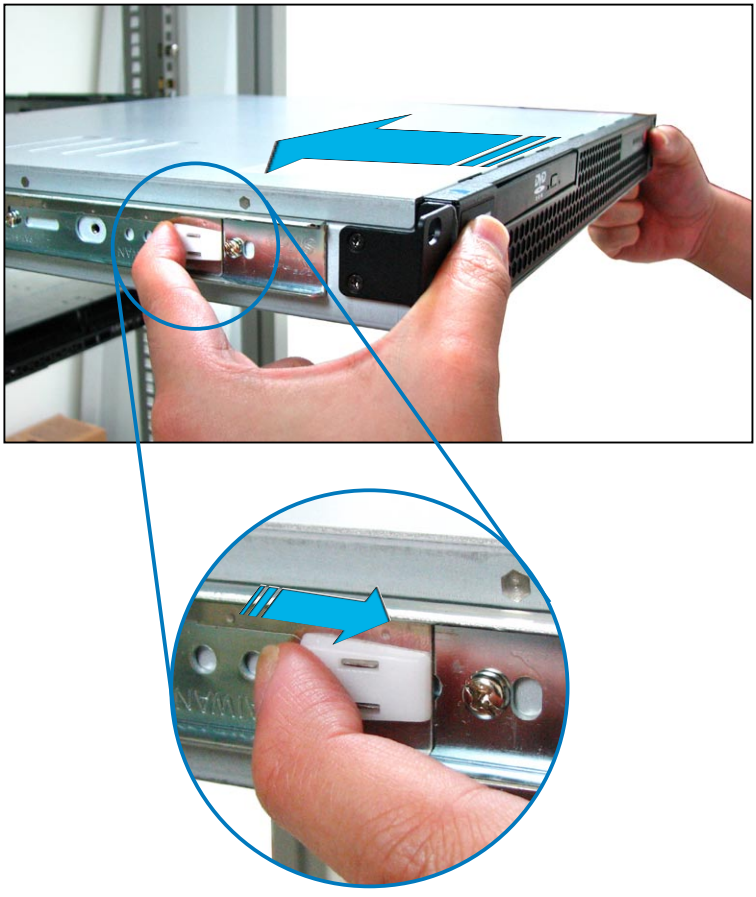


6. Secure the outer rail with two screws at the front and rear of the rack cabinet .
7. Find the corresponding 1U space on the other side of the rack cabinet then repeat steps 5 and 6 to attach the other outer rail.

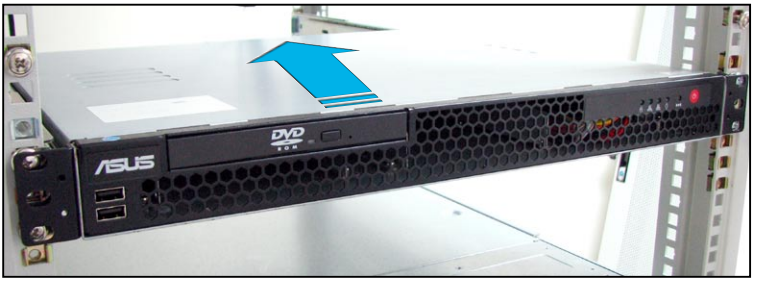


8. Firmly hold the server on both sides. Slide the latches on the inner rack rails to the direction indicated below. Hold the latches, and insert the rear side of the server to the front end of the outer rack rail.

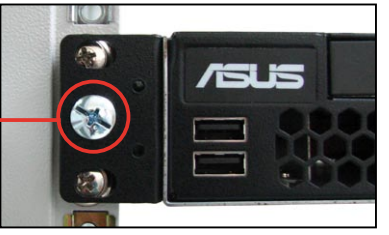
   Make sure that the inner rails are properly aligned with the outer rails.



9. Carefully push the server all the way to the back until the front panel fits the front end of the rack.



10. Secure the server to the rack with one rack screw at one side. Secure the other side as well.

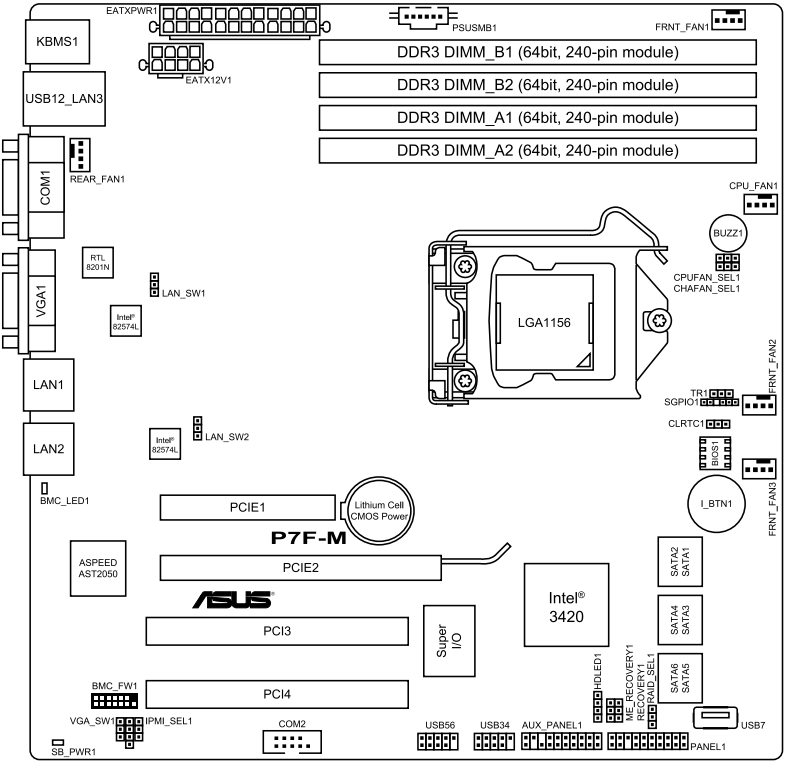


Chapter 4

This chapter includes the motherboard layout and brief descriptions of the jumpers and internal connectors.

Motherboard Info

4.1 Motherboard layout



Layout contents

Jumpers		Page
1.	Clear RTC RAM (CLRTC1)	4-4
2.	VGA controller setting (3-pin VGA_SW1)	4-5
3.	CPU Fan and Chassis Fan control setting (3-pin CPUFAN_SEL1, CHAFAN_SEL1)	4-5
4.	LAN controller setting (3-pin LAN_SW1, LAN_SW2)	4-6
5.	RAID configuration utility selection (3-pin RAID_SEL1)	4-6
6.	Force BIOS recovery setting (3-pin RECOVERY1)	4-7

Internal connectors		Page
1.	Serial ATA connectors (7-pin SATA1–4 [Red], SATA5–6 [Black])	4-8
2.	Hard disk activity LED connector (4-pin HDLED1)	4-8
3.	USB connector (10-1 pin USB34, USB56; A-Type USB7)	4-9
4.	CPU, front and rear fan connectors (4-pin CPU_FAN1, FRNT_FAN1, FRNT_FAN2, FRNT_FAN3, REAR_FAN1)	4-9
5.	Serial General Purpose Input/Output connector (6-1 pin SGPIO1)	4-10
6.	Serial port connector (10-1 pin COM2)	4-10
7.	BMC header (BMC_FW1)	4-11
8.	Power Supply SMBus connector (5-pin PSUSMB1)	4-11
9.	ATX power connectors (24-pin ATXPWR1, 8-pin ATX12V1)	4-12
10.	System panel connector (20-1 pin PANEL1)	4-13
11.	Auxiliary panel connector (20-2 pin AUX_PANEL1)	4-14

4.2 Jumpers

1. Clear RTC RAM (CLRTC1)

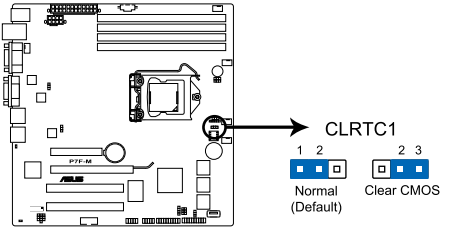
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1–2 (default) to pins 2–3. Keep the cap on pins 2–3 for about 5–10 seconds, then move the cap back to pins 1–2.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

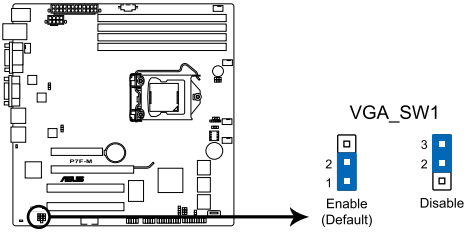
If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.



P7F-M Clear RTC RAM

2. VGA controller setting (3-pin VGA_SW1)

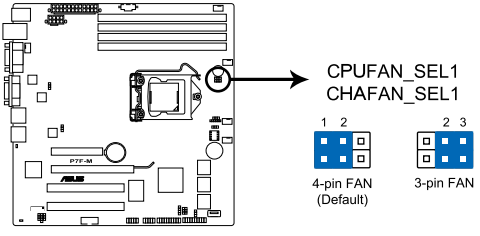
This jumper allows you to enable or disable the onboard VGA controller. Set to pins 1–2 to activate the VGA feature.



P7F-M VGA setting

3. CPU Fan and Chassis Fan control setting (3-pin CPUFAN_SEL1, CHAFAN_SEL1)

These jumpers allow you to switch for fan pin selection. The CPUFAN_SEL1 jumper is for the CPU fans control and the CHAFAN_SEL1 jumper is for the front fans and rear fans control. Set to pins 1–2 when using 4-pin fans or pins 2–3 when using 3-pin fans.

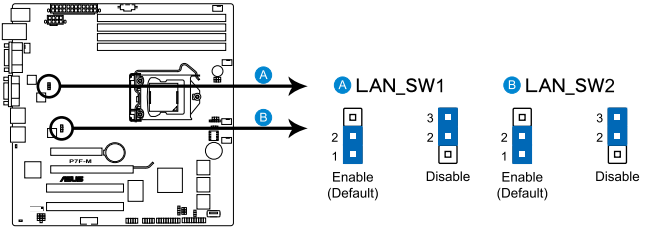


P7F-M FAN setting

- If you use a 4-pin fan but set the jumper to pin 2–3, the fan you installed may not work.
- If you use a 3-pin fan but set the jumper for a 4-pin fan, the fan control will not work and the fan you installed will always run at full speed.

4. LAN controller setting (3-pin LAN_SW1, LAN_SW2)

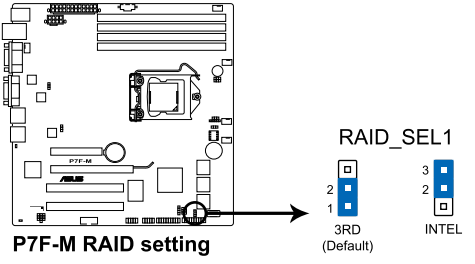
These jumpers allow you to enable or disable the onboard Intel® Intel 82574LGigabit LAN controllers. Set to pins 1–2 to activate the Gigabit LAN feature.



P7F-M LAN_SW setting

5. RAID configuration utility selection (3-pin RAID_SEL1)

This jumper allows you to select the RAID configuration utility to use when you create disk arrays. Place the jumper caps over pins 1–2 if you want to use the LSI Logic Embedded SATA RAID Setup Utility (default); otherwise, place the jumper caps to pins 2–3 to use the Intel® Matrix Storage Manager.



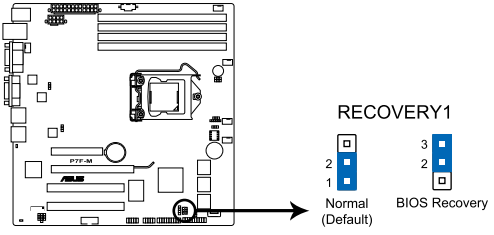
P7F-M RAID setting

6. Force BIOS recovery setting (3-pin RECOVERY1)

This jumper allows you to quickly update or recover the BIOS settings when it becomes corrupted.

To update the BIOS:

1. Prepare a USB flash disk that contains the original or latest BIOS for the motherboard (XXXXXX.ROM).
2. Set the jumper to pins 2–3.
3. Insert the USB flash and turn on the system to update the BIOS.
4. Shut down the system.
5. Set the jumper back to pins 1–2.
6. Turn on the system.



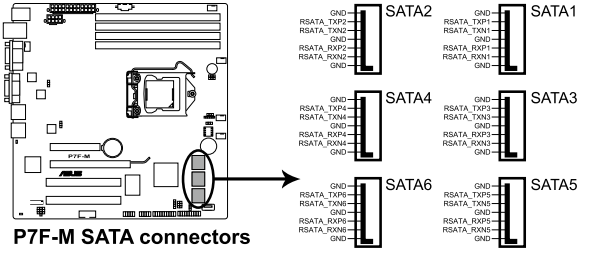
P7F-M BIOS recovery setting

4.3 Internal connectors

1. Serial ATA connectors (7-pin SATA1–4 [Red]; 7-pin SATA5–6 [Black])

Supported by the Intel® 3420 chipset, these connectors are for the Serial ATA signal cables for Serial ATA hard disk drives that allows up to 3Gb/s of data transfer rate.

If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 10, or RAID 5 configuration.

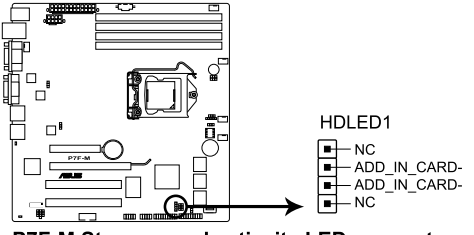


P7F-M SATA connectors

The actual data transfer rate depends on the speed of Serial ATA hard disks installed.

2. Hard disk activity LED connector (4-pin HDLED1)

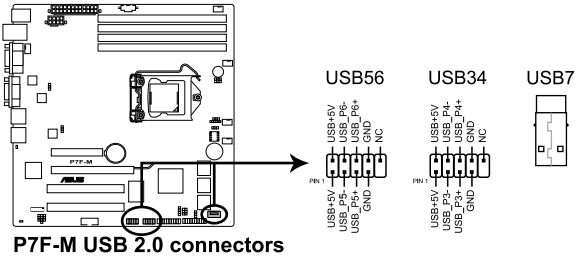
This LED connector is for the storage add-on card cable connected to the SATA or SAS add-on card. The read or write activities of any device connected to the SATA or SAS add-on card causes the front panel LED to light up.



P7F-M Storage card actisvity LED connector

3. USB connector (10-1 pin USB34, USB56; A-Type USB7)

These connectors are for USB 2.0 ports. Connect the USB module cables to connectors USB34, then install the modules to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.

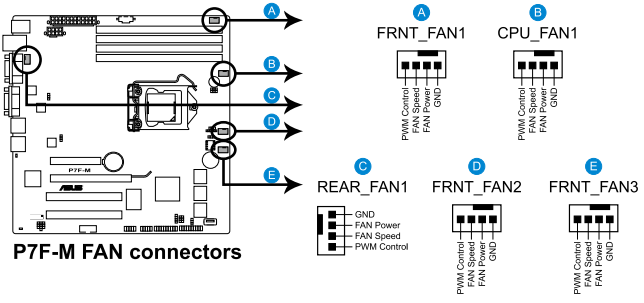


P7F-M USB 2.0 connectors

4. CPU, front and rear fan connectors (4-pin CPU_FAN1, FRNT_FAN1, FRNT_FAN2, FRNT_FAN3, REAR_FAN1)

The fan connectors support cooling fans of 350 mA–740 mA (8.88 W max.) or a total of 1.75 A–3.7 A (44.4 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

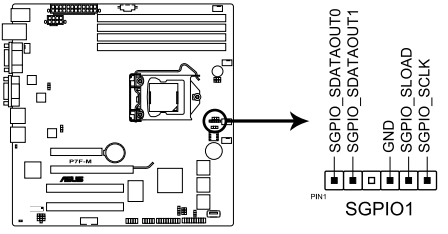
- DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.
- These are not jumpers! DO NOT place jumper caps on the fan connectors!
- All fans feature the ASUS Fan Speed Control technology.



P7F-M FAN connectors

5. Serial General Purpose Input/Output connector (6-1 pin SGPIO1)

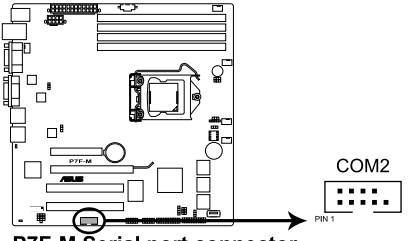
This connector is used for the SGPIO peripherals for the LSI MegaRAID and Intel Matrix RAID SATA LED.



P7F-M SGPIO connector

6. Serial port connector (10-1 pin COM2)

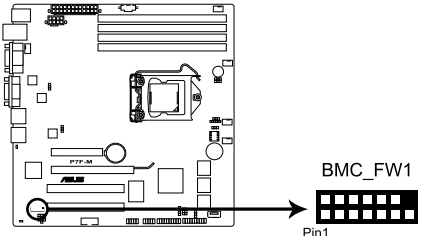
This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



P7F-M Serial port connector

7. BMC header (BMC_FW1)

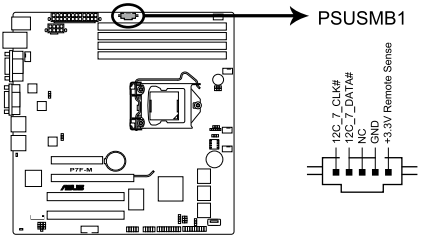
The BMC connector on the motherboard supports an ASUS® Server Management Board 4 Series (ASMB4).



P7F-M BMC connector

8. Power Supply SMBus connector (5-pin PSUSMB1)

This connector allows you to connect SMBus (System Management Bus) to the power supply unit to read PSU information. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

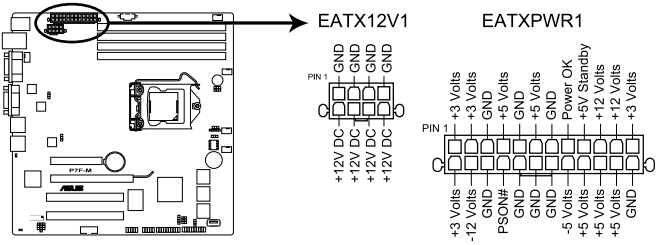


P7F-M Power supply SMBus connector

9. ATX power connectors (24-pin ATXPWR1, 8-pin ATX12V1)

These connectors are for an ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

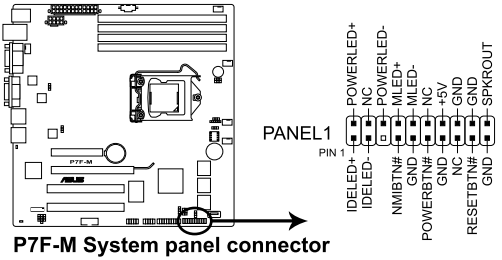
- DO NOT forget to connect the 24+8-pin power plugs; otherwise, the system will not boot up.
- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- This motherboard supports ATX2.0 PSU or later version.
- Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system.


EATX12V1
EATXPWR1
PIN 1
GND GND GND GND
+12V DC +12V DC +12V DC +12V DC
PIN 1
+3 Volts +3 Volts GND +5 Volts GND +5 Volts GND Power OK +5V Standby +12 Volts +12 Volts +3 Volts
+3 Volts -12 Volts GND PSON# GND GND GND -5 Volts +5 Volts +5 Volts +5 Volts GND

P7F-M ATX power connectors

10. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.



P7F-M System panel connector

1. System power LED (3-pin PLED)

This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

2. Message LED (2-pin MLED)

This 2-pin connector is for the message LED cable that connects to the front message LED. The message LED is controlled by Hardware monitor to indicate an abnormal event occurance.

3. System warning speaker (4-pin SPEAKER)

This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

4. Hard disk drive activity LED (2-pin HDDLED)

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

5. ATX power button/soft-off button (2-pin PWRSW)

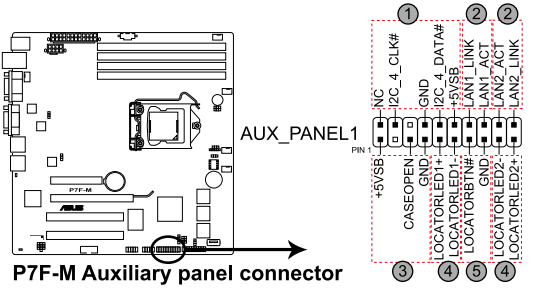
This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

6. Reset button (2-pin RESET)

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

11. Auxiliary panel connector (20-pin AUX_PANEL1)

This connector is for additional front panel features including front panel SMB, locator LED and switch, chassis intrusion, and LAN LEDs.



1. **Front panel SMB (6-1 pin FPSMB)**
   These leads connect the front panel SMBus cable.

2. **LAN activity LED (2-pin LAN1_LED, LAN2_LED)**
   These leads are for Gigabit LAN activity LEDs on the front panel.

3. **Chassis intrusion (4-1 pin CHASSIS)**
   These leads are for the intrusion detection feature for chassis with intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to these leads to record a chassis intrusion event. The default setting is short CASEOPEN and GND pin by jumper cap to disable the function.

4. **Locator LED (2-pin LOCATORLED1 and 2-pin LOCATORLED2)**
   These leads are for the locator LED1 and LED2 on the front panel. Connect the Locator LED cables to these 2-pin connector. The LEDs will light up when the Locator button is pressed.

5. **Locator Button/Swich (2-pin LOCATORBTN)**
   These leads are for the locator button on the front panel. This button queries the state of the system locator.

Chapter 5

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

BIOS setup

5.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup:

1. **ASUS EZ Flash 2** (Updates the BIOS using a USB flash disk.)
2. **BUPDATER utility** (Updates the BIOS in DOS mode using a bootable USB flash disk drive.)
3. **ASUS CrashFree BIOS 3** (To recover the BIOS using a bootable USB flash disk drive when the BIOS file fails or gets corrupted.)

Refer to the corresponding sections for details on these utilities.

Save a copy of the original motherboard BIOS file to a bootable USB flash disk drive in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

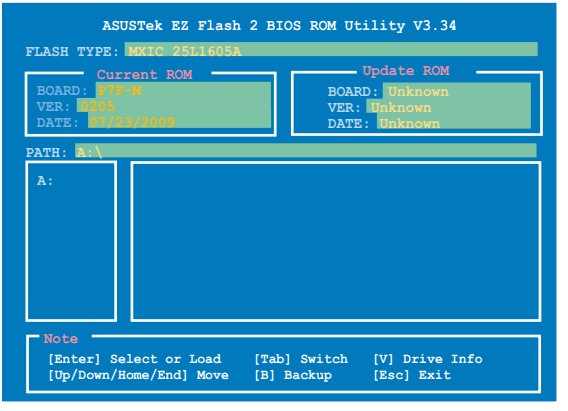
5.1.1 ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without having to use a DOS-based utility.

Before you start using this utility, download the latest BIOS from the ASUS website at www.asus.com.

To update the BIOS using EZ Flash 2

1. Insert the USB flash disk that contains the latest BIOS file to the USB port.
2. Enter the BIOS setup program. Go to the **Tools** menu to select **EZ Flash 2** and press <Enter> to enable it.
   Or, press <Alt> + <F2> during the POST to enable EZ Flash 2.



3. Press <Tab> to switch between drives until the correct BIOS file is found. When found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.

- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the Load Setup Defaults item under the Exit menu. See section **5.9 Exit Menu** for details.

5.1.2 BUPDATER utility

The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be the same as shown.

The BUPDATER utility allows you to update the BIOS file in DOS environment using a bootable USB flash disk drive with the updated BIOS file.

Updating the BIOS file

To update the BIOS file using the BUPDATER utility:

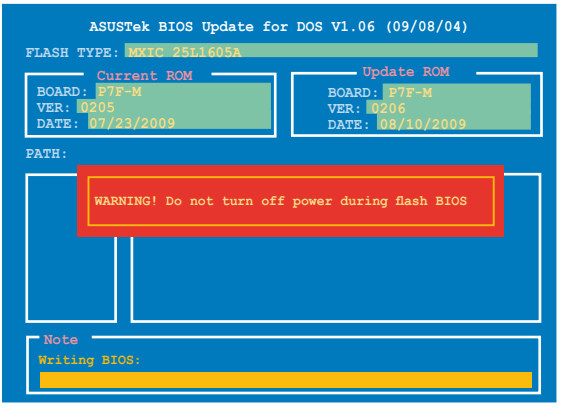
1. Visit the ASUS website at www.asus.com and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable USB flash disk drive.
2. Copy the BUPDATER utility (BUPDATER.exe) from the ASUS support website at support.asus.com to the bootable USB flash disk drive you created earlier.
3. Boot the system in DOS mode, then at the prompt, type:

   `BUPDATER /i[filename].ROM`

   where [filename] is the latest or the original BIOS file on the bootable USB flash disk drive, then press <Enter>.

```
A:\>BUPDATER /i[file name].ROM
```

4. The utility verifies the file, then starts updating the BIOS file.



DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

5.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using a USB flash drive that contains the updated BIOS file.

Prepare a USB flash drive containing the updated motherboard BIOS before using this utility.

Recovering the BIOS from a USB flash drive

To recover the BIOS from a USB flash drive:

1. Insert the USB flash drive with the original or updated BIOS file to one USB port on the system.
2. The utility will automatically recover the BIOS. It resets the system when the BIOS recovery finished.

DO NOT shut down or reset the system while recovering the BIOS! Doing so would cause system boot failure!

The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website at www.asus.com to download the latest BIOS file.

5.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section **5.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup." This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware chip.

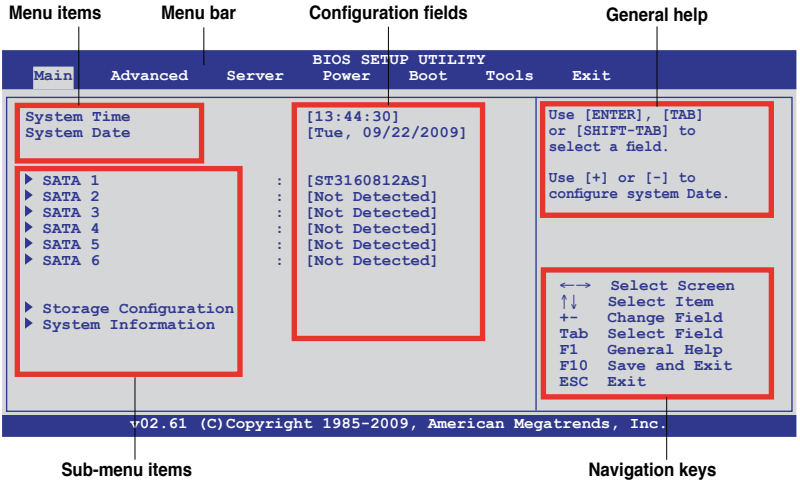
The firmware chip on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Default Settings** item under the Exit Menu. See section **5.9 Exit Menu**.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website at www.asus.com to download the latest BIOS file for this motherboard.

5.2.1 BIOS menu screen



5.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Server	For changing the advanced server settings
Power	For changing the advanced power management (APM) configuration
Boot	For changing the system boot configuration
Tools	For configuring options for special functions
Exit	For selecting the exit options and loading default settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

5.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

5.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu; for example, selecting Main shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.

5.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the item has a sub-menu. To display the sub-menu, select the item and press <Enter>.

5.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display available options. Refer to **5.2.7 Pop-up window**.

5.2.7 Pop-up window

Select a menu item and press <Enter> to display a pop-up window with the configuration options for that item.

5.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> /<Page Down> keys to display the other items on the screen.

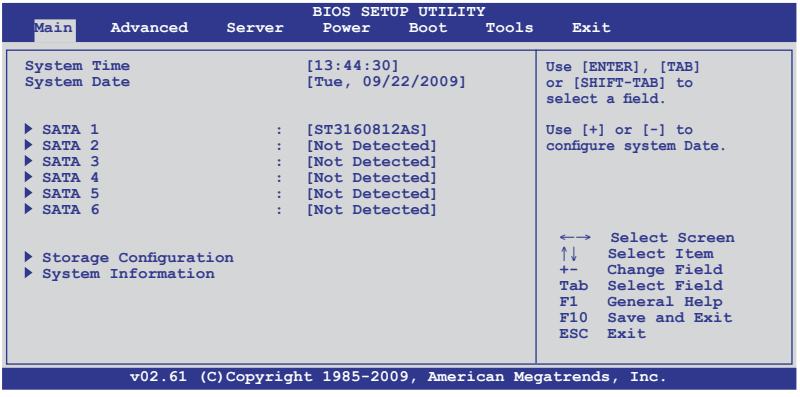
5.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

5.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears, giving you an overview of the basic system information.

Refer to section **5.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.


BIOS SETUP UTILITY
Main Advanced Server Power Boot Tools Exit
System Time [13:44:30]
System Date [Tue, 09/22/2009]
SATA 1 : [ST3160812AS]
SATA 2 : [Not Detected]
SATA 3 : [Not Detected]
SATA 4 : [Not Detected]
SATA 5 : [Not Detected]
SATA 6 : [Not Detected]
Storage Configuration
System Information
Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Use [+] or [-] to configure system Date.
←→ Select Screen
↑↓ Select Item
+- Change Field
Tab Select Field
F1 General Help
F10 Save and Exit
ESC Exit
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5.3.1 System Time [xx:xx:xx]

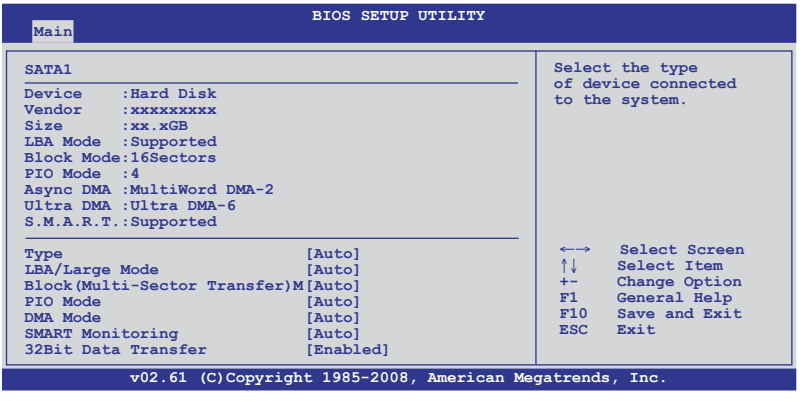
Allows you to set the system time.

5.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

5.3.3 SATA1—6

While entering Setup, the BIOS automatically detects the presence of IDE/SATA devices. There is a separate submenu for each IDE/SATA device. Select a device item then press <Enter> to display the SATA device information.



The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and S.M.A.R.T. monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

Type [Auto]

Allows you to select the type of device connected to the system.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

Block (Multi-Sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Allows you to select the data transfer mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Sets the DMA mode.
Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

SMART Monitoring [Auto]

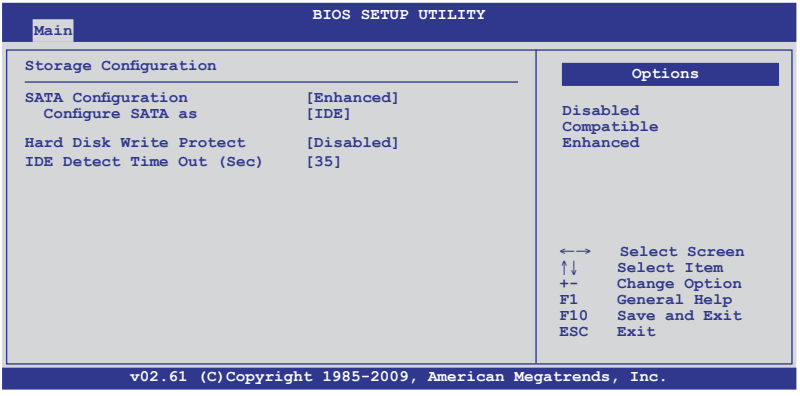
Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer.
Configuration options: [Disabled] [Enabled]

5.3.4 Storage Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press <Enter> if you wish to configure the item.



SATA Configuration [Enhanced]

Configuration options: [Disabled] [Compatible] [Enhanced]

Configure SATA as [IDE]

Sets the configuration for the Serial ATA connectors supported by the Southbridge chip. Configuration options: [IDE] [RAID] [AHCI]

- If you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices, keep the default setting [IDE].
- If you want the Serial ATA hard disk drives to use the Advanced Host Controller Interface (AHCI), set this item to [AHCI]. The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.
- If you want to create RAID sets with LSI MegaRAID utility, or Intel® Matrix Storage Technology from the Serial ATA hard disk drives, set this item to [RAID].

Hard Disk Write Protect [Disabled]

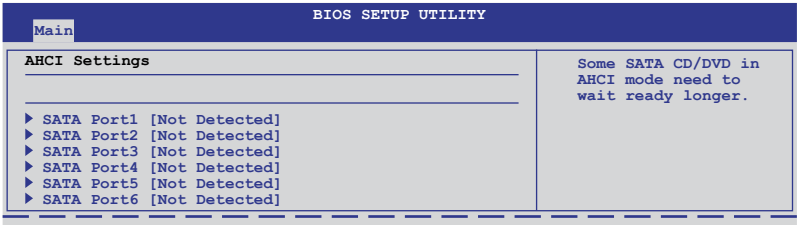
Disables or enables device write protection. This will be effective only if the device is accessed through BIOS.
Configuration option: [Disabled] [Enabled]

IDE Detect Time Out (Sec) [35]

Selects the time out value for detecting ATA/ATAPI devices.
Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

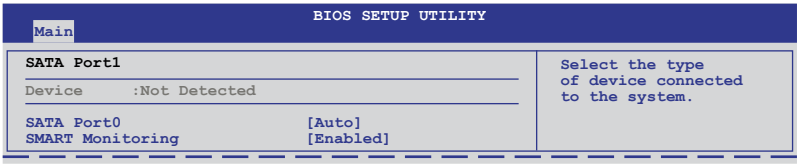
5.3.5 AHCI Configuration

This menu is the section for AHCI configuration.


BIOS SETUP UTILITY
Main
AHCI Settings
Some SATA CD/DVD in AHCI mode need to wait ready longer.
SATA Port1 [Not Detected]
SATA Port2 [Not Detected]
SATA Port3 [Not Detected]
SATA Port4 [Not Detected]
SATA Port5 [Not Detected]
SATA Port6 [Not Detected]

SATA Port1–6 [XXXX]

Displays the status of auto-detection of SATA devices.



SATA Port0 [Auto]

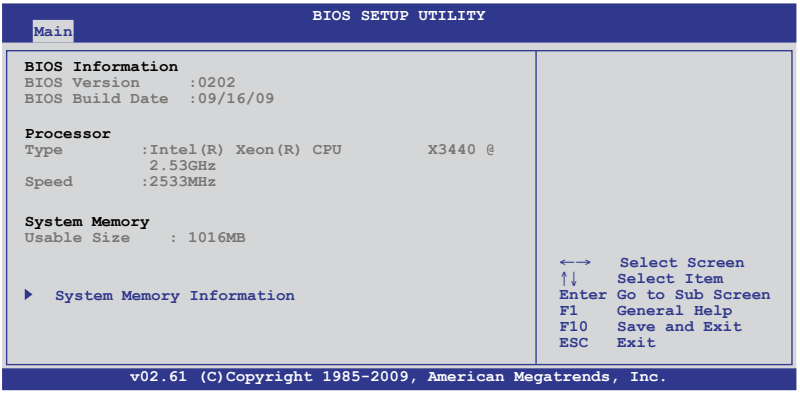
Allows you to select the type of device connected to the system.
Configuration options: [Auto] [Not Installed]

SMART Monitoring [Enabled]

Allows you to set the Self-Monitoring, Analysis and Reporting Technology.
Configuration options: [Disabled] [Enabled]

5.3.6 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.



BIOS Information

Displays the auto-detected BIOS information.

Processor

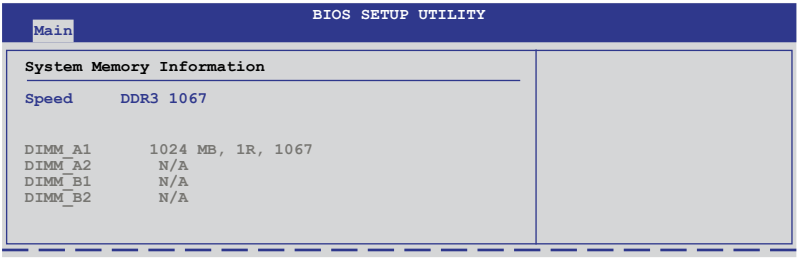
Displays the auto-detected CPU specification.

System Memory

Displays the auto-detected system memory.

System Memory Information

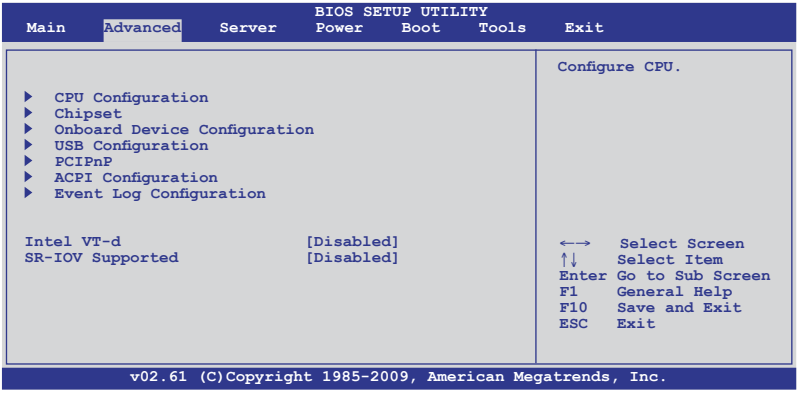
Displays system memory information.



5.4 Advanced menu

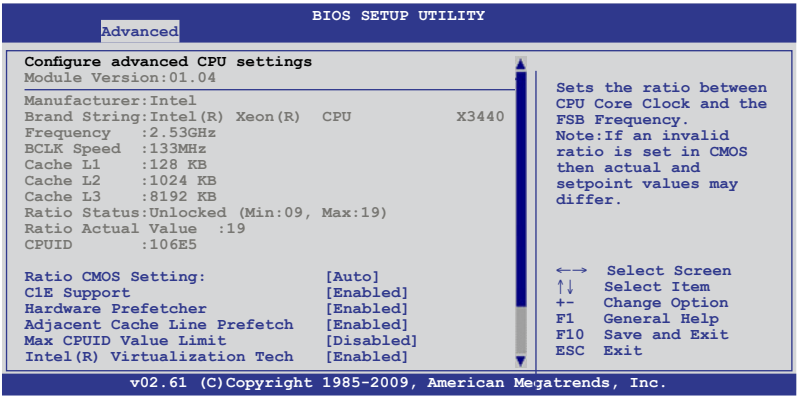
The Advanced menu items allow you to change the settings for the CPU and other system devices.

Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



5.4.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects. Some items may not appear if your CPU does not support the related functions.


BIOS SETUP UTILITY
Advanced
Configure advanced CPU settings
Module Version:01.04
Manufacturer:Intel
Brand String:Intel(R) Xeon(R) CPU X3440
Frequency :2.53GHz
BCLK Speed :133MHz
Cache L1 :128 KB
Cache L2 :1024 KB
Cache L3 :8192 KB
Ratio Status:Unlocked (Min:09, Max:19)
Ratio Actual Value :19
CPUID :106E5
Ratio CMOS Setting: [Auto]
C1E Support [Enabled]
Hardware Prefetcher [Enabled]
Adjacent Cache Line Prefetch [Enabled]
Max CPUID Value Limit [Disabled]
Intel(R) Virtualization Tech [Enabled]
Sets the ratio between CPU Core Clock and the FSB Frequency.
Note:If an invalid ratio is set in CMOS then actual and setpoint values may differ.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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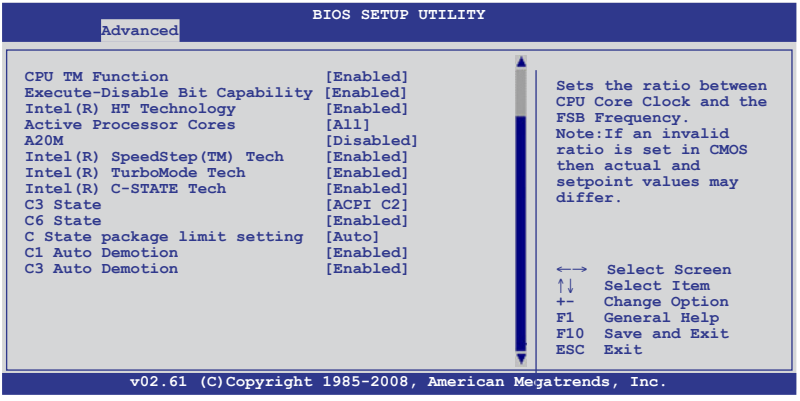
Scroll down for more items.


BIOS SETUP UTILITY
Advanced
CPU TM Function [Enabled]
Execute-Disable Bit Capability [Enabled]
Intel(R) HT Technology [Enabled]
Active Processor Cores [All]
A20M [Disabled]
Intel(R) SpeedStep(TM) Tech [Enabled]
Intel(R) TurboMode Tech [Enabled]
Intel(R) C-STATE Tech [Enabled]
C3 State [ACPI C2]
C6 State [Enabled]
C State package limit setting [Auto]
C1 Auto Demotion [Enabled]
C3 Auto Demotion [Enabled]
Sets the ratio between CPU Core Clock and the FSB Frequency.
Note:If an invalid ratio is set in CMOS then actual and setpoint values may differ.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Ratio CMOS Setting [Auto]

Allows you to adjust the ratio between CPU Core Clock and BCLK Frequency. Use the <+> and <-> keys to adjust the value.
Configuration options: [Auto] [09.0] [10.0] [11.0] [12.0] [13.0] [14.0] [15.0] [16.0] [17.0] [18.0] [19.0] [20.0]

C1E Support [Enabled]

Allows you to enable or disable Enhanced Halt State support.
Configuration options: [Disabled] [Enabled]

Hardware Prefetcher [Enabled]

Allows you to enable or disable the Hardware Prefetcher function.
Configuration options: [Disabled] [Enabled]

Adjacent Cache Line Prefetch [Enabled]

Allows you to enable or disable the Adjacent Cache Line Prefetch function.
Configuration options: [Disabled] [Enabled]

Max CPUID Value Limit [Disabled]

Setting this item to [Enabled] allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.
Configuration options: [Disabled] [Enabled]

Intel(R) Virtualization Tech [Enabled]

The Intel® Virtualization Technology allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems. Configuration options: [Disabled] [Enabled]

CPU TM Function [Enabled]

This function enables the overheated CPU to throttle the clock speed to cool down. Configuration options: [Disabled] [Enabled]

Execute-Disable Bit Capability [Enabled]

Allows you to enable or disable the No-Execution Page Protection Technology. Setting this item to [Disabled] forces the XD feature flag to always return to zero (0). Configuration options: [Disabled] [Enabled]

Intel(R) HT Technology [Disabled]

Allows you to enable or disable the Intel Hyper-Threading Technology function. When disabled, only one thread per activated core is enabled.
Configuration options: [Enabled] [Disabled]

Active Processor Cores [All]

Allows you to choose the number of CPU cores to activate in each processor package.Configuration options: [All] [1] [2]

A20M [Disabled]

Legacy OSes and APs may need A20M enabled.
Configuration options: [Disabled] [Enabled]

Intel(R) SpeedStep (TM) Tech [Enabled]

When set to [Disabled], the CPU runs at its default speed. When set to [Enabled], the CPU speed is controlled by the operating system.
Configuration options: [Disabled] [Enabled]

Intel(R) TurboMode Tech [Enabled]

Turbo mode allows processor cores to run faster than marked frequency in specific condition.Configuration options: [Disabled] [Enabled]

Intel(R) C-STATE Tech [Enabled]

The Intel® C-State Technology allows the CPU to save more power under idle mode. Enable this item only when you install a C-State Technology-supported CPU. Configuration options: [Disabled] [Enabled]

The following items appear only when you set the **Intel(R) C-STATE Tech** item to [Enabled].

C3 State [ACPI C2]

Allows you to select Nehalem C state action.
Configuratiton options: [Disabled] [ACPI C2] [ACPI C3]

C6 State [Enabled]

Allows you to select Nehalem C state action.
Configuratiton options: [Disabled] [Enabled]

C State package limit setting [Auto]

We recommend that you set this item to [Auto] for BIOS to automatically detect the C-State mode supported by your CPU.
Configuration options: [Auto] [C1] [C3] [C6]

C1 Auto Demotion [Enabled]

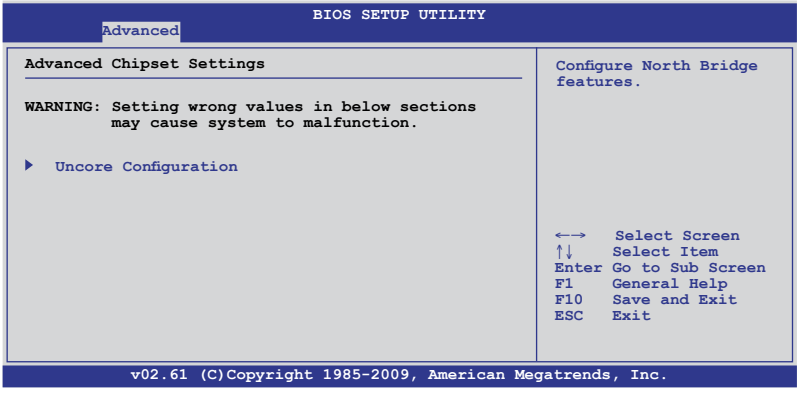
When this item is enabled, the CPU will conditionally demote C3/C6 requests to C1 based on the uncore auto-demote information.
Configuration options: [Disabled] [Enabled]

C3 Auto Demotion [Enabled]

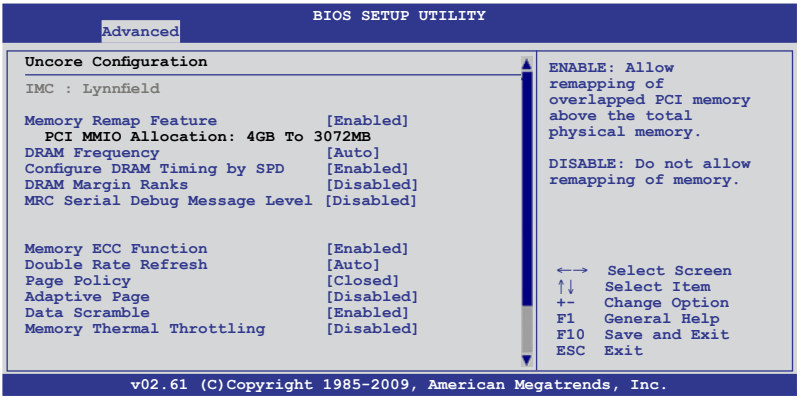
When this item is enabled, the CPU will conditionally demote C6 requests to C3 based on the uncore auto-demote information.
Configuration options: [Disabled] [Enabled]

5.4.2 Chipset

The Chipset configuration menu allows you to change advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



Uncore Configuration


BIOS SETUP UTILITY
Advanced
Uncore Configuration
IMC : Lynnfield
Memory Remap Feature [Enabled]
PCI MMIO Allocation: 4GB To 3072MB
DRAM Frequency [Auto]
Configure DRAM Timing by SPD [Enabled]
DRAM Margin Ranks [Disabled]
MRC Serial Debug Message Level [Disabled]
Memory ECC Function [Enabled]
Double Rate Refresh [Auto]
Page Policy [Closed]
Adaptive Page [Disabled]
Data Scramble [Enabled]
Memory Thermal Throttling [Disabled]
ENABLE: Allow remapping of overlapped PCI memory above the total physical memory.
DISABLE: Do not allow remapping of memory.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Memory Remap Feature [Enabled]

Setting this item to [Enabled] allows you to remapp the overlapped PCI memory above the total physical memory. Configuration options: [Disabled] [Enabled]

DRAM Frequency [Auto]

You may allow the system to detect DDR3 memory frequency via SPD or designate a specific frequency.
Configuration options: [Auto] [800 MHz] [1066 MHz] [1333 MHz]

Refer to the memory AVL on ASUS website at www.asus.com.

Configure DRAM Timing by SPD [Enabled]

Configuration options: [Enabled] [Disabled]

The ofllowing 10 items appear when you set Configure DRAM Timing by SPD to [Disabled].

DRAM tCL [7]
Configuration options: [3]—[15]

DRAM tRAS [20]
Configuration options: [9]—[63]

DRAM tRP [7]
Configuration options: [3]—[15]

DRAM tRCD [7]
Configuration options: [3]—[15]

DRAM tWR [8]
Configuration options: [3]—[31]

DRAM tRFC [59]
Configuration options: [15]—[255]

DRAM tWTR [4]
Configuration options: [4]—[31]

DRAM tRRD [4]
Configuration options: [4]—[15]

DRAM tRTP [4]
Configuration options: [4]—[15]

DRAM tFAW [20]
Configuration options: [15]—[63]

DRAM Margin Ranks [Disabled]

Configuration options: [Enabled] [Disabled]

MRC Serial Debug Message Level [Disabled]

Configuration options: [Disabled] [Minimum] [Maximum] [Test]

Memory ECC Function [Enabled]

Allows you to enable or disable Memory ECC fucntion.
Configuration options: [Disabled] [Enabled]

Double Rate Refresh [Auto]

Allows you to enable or disable Double Rate Refresh.
Configuration options: [Auto] [Disabled]

Page Poilcy [Closed]

Configuration options: [Closed] [Open]

Adaptive Page [Disabled]

Configuration options: [Disabled] [Enabled]

Data Scramble [Disabled]

Configuration options: [Disabled] [Enabled]

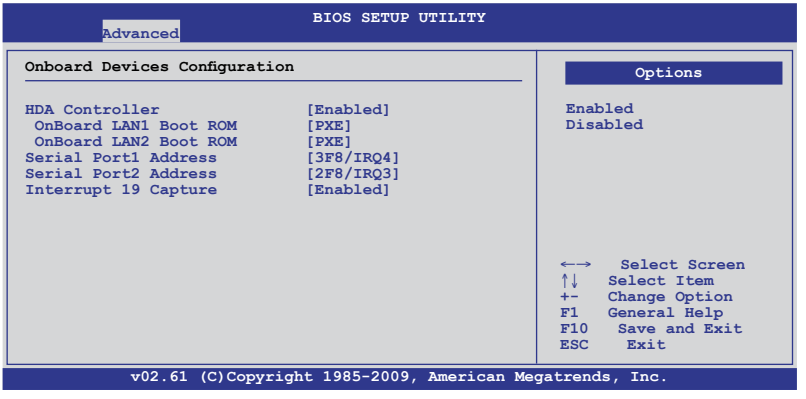
Memory Thermal Throttling [Disabled]

Setting this item to [CLTT] to Closed Loop Thermal Throttling and [OLTT] to Open Loop Thermal Throttling. Configuration options: [CLTT] [OLTT] [Disabled] [Auto]

5.4.3 Onboard Devices Configuration

The Onboard Devices Configuration menu items allow you to change the advanced settings for onboard devices.

Take caution when changing the settings of the Onboard Devices Configuration menu items. Incorrect field values can cause the system to malfunction.



HDA Controller [Enabled]

Allows you to enable or disable the High Definition Audio controller.
Configuration options: [Enabled] [Disabled]

Onboard LAN1/2 Boot ROM [PXE]
Allows you to configure the onboard LAN1/2 boot mode.
Configuration: [Disabled] [PXE] [iSCSI]

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]

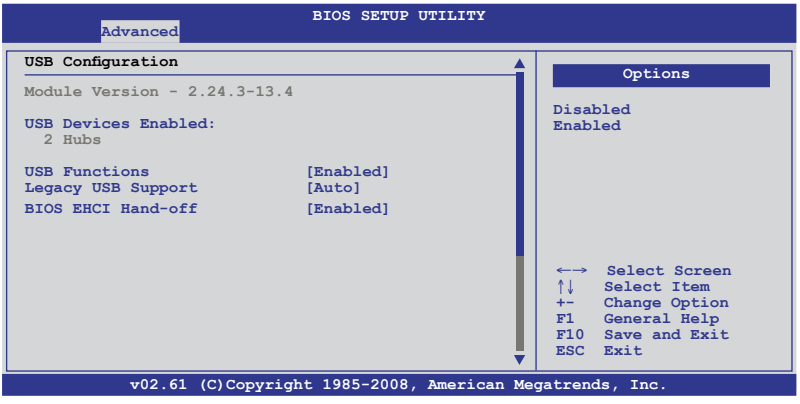
Serial Port2 Address [2F8/IRQ3]

Allows you to select the Serial Port2 base address.
Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Interrupt 19 Capture [Enabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19.
Configuration options: [Disabled] [Enabled]

5.4.4 USB Configuration



USB Functions [Enabled]

Allows you to enabled or disable the USB function.
Configuration options: [Disabled] [Enabled]

Legacy USB Support [Enabled]

Allows you to enable or disable support for legacy USB devices. Setting to [Auto] allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled. Configuration options: [Disabled] [Enabled] [Auto]

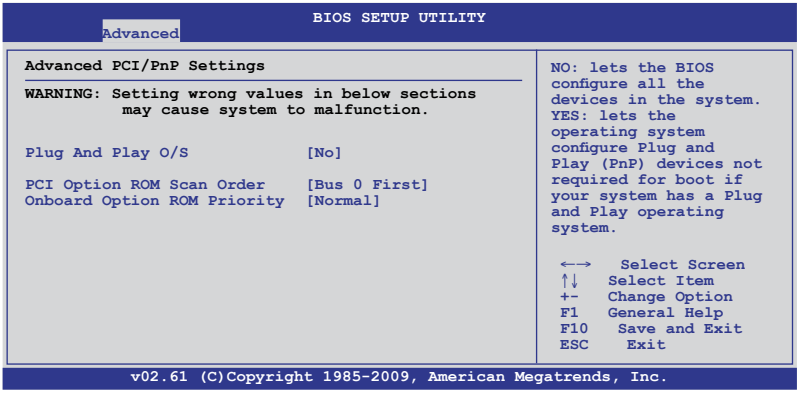
BIOS EHCI Hand-Off [Enabled]

Enables or disables the BIOS EHCI hand-off support.
Configuration options: [Disabled] [Enabled]

5.4.5 PCIPnP

The PCIPnP menu items allow you to change the advanced settings for PCI/PnP devices.

Take caution when changing the settings of the PCI/PnP Configuration menu items. Incorrect field values can cause the system to malfunction.


BIOS SETUP UTILITY
Advanced
Advanced PCI/PnP Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
Plug And Play O/S [No]
PCI Option ROM Scan Order [Bus 0 First]
Onboard Option ROM Priority [Normal]
NO: lets the BIOS configure all the devices in the system. YES: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Plug And Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.
Configuration options: [No] [Yes]

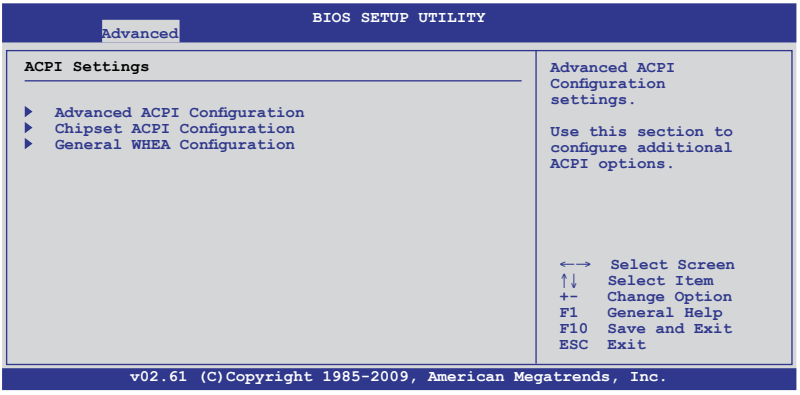
PCI Option ROM Scan Order [Bus 0 First]

Allows you to select the PCI option ROM scanning order. The scanning of the option ROM will start from the lowest bus, device, fucntion number if you set this item to [Bus 0 First]; the scanning starts from the highest bus, device, function number if you set this item to [Bus N First].
Configuration options: [Bus 0 First] [Bus N First]

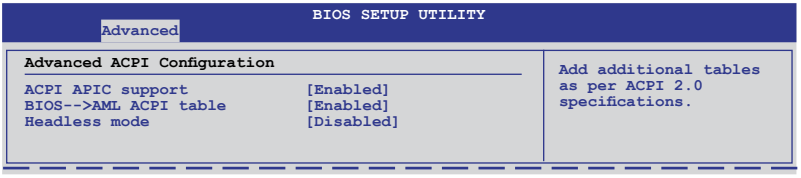
Onboard Option ROM Priority [Normal]

Allows you to select the onboard option ROM priority.
Configuration options: [Normal] [High]

5.4.6 ACPI Configuration



Advanced ACPI Configuration



ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When set to [Enabled], the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

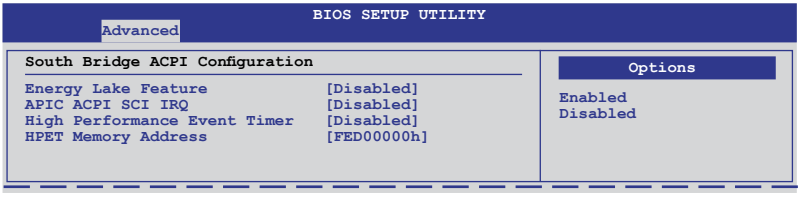
BIOS-->AML ACPI table [Enabled]

Allows you to include the BIOS-->AML exchange table pointer to (X)RSDT pointer list.Configuration options: [Disabled] [Enabled]

Headless mode [Disabled]

Allows you to enable or disable the Headless operation mode through ACPI. Configuration options: [Disabled] [Enabled]

Chipset ACPI Configuration



Energy Lake Feature [Disabled]

Allows you to enable or disable the Energy Lake feature.
Configuration options: [Enabled] [Disabled]

We do not recommend you enable this feature.

APIC ACPI SCI IRQ [Disabled]

Allows you to enable or disable the APIC ACPI SCI IRQ feature.
Configuration options: [Disabled] [Enabled]

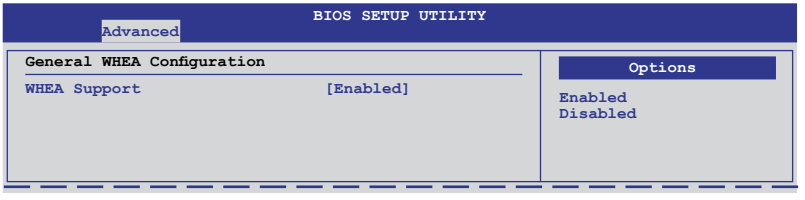
High Performance Event Timer [Disabled]

Allows you to enable or disable the High Performance Event Timer feature.
Configuration options: [Disabled] [Enabled]

HPET Memory Address [FED00000h]

Configuration options: [FED00000h] [FED01000h] [FED02000h] [FED03000h]

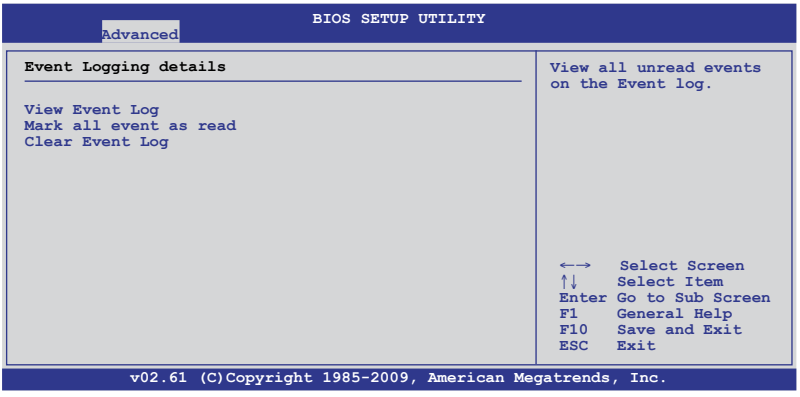
General WHEA Configuration



WHEA Support [Enabled]

Allows you to enable or disable the Windows Hardware Error Architecture.
Configuration options: [Disabled] [Enabled]

5.4.7 Event Log Configuration



View Event Log
Press <Enter> to read all the unread event log.

Mark all events as read
Press <Enter> to mark all the events as read.

Clear Event Log
Press <Enter> to clear all events on the event log.

5.4.8 Intel VT-d Configuration [Disabled]

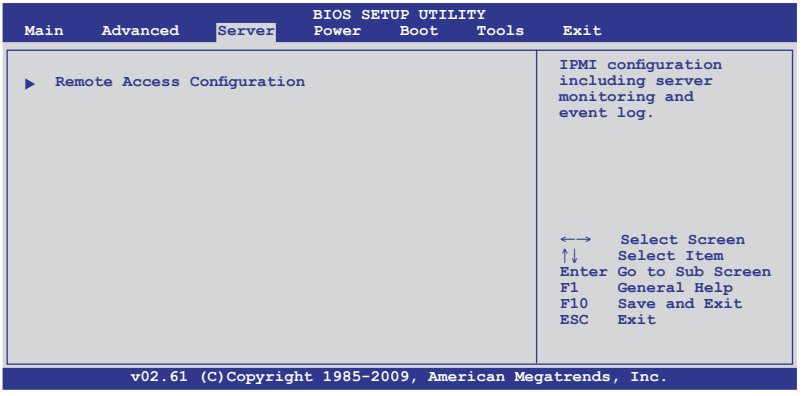
Allows you to enable or disable the Intel Virtualization Technology for Directed I/O.
Configuration options: [Disabled] [Enabled]

5.4.9 SR-IOV Supprted [Disabled]

Configuration options: [Disabled] [Enabled]

5.5 Server menu

The Server menu items allow you to customize the server features.


BIOS SETUP UTILITY
Main Advanced Server Power Boot Tools Exit
Remote Access Configuration
IPMI configuration including server monitoring and event log.
←→ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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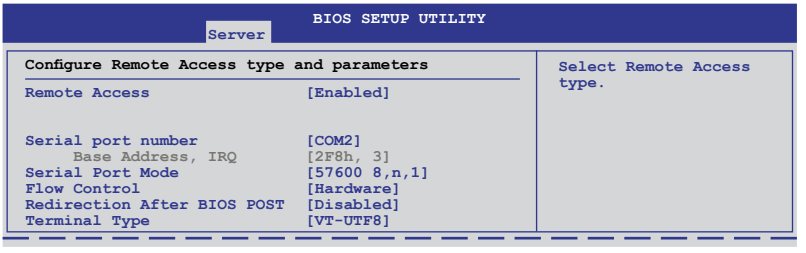
Remote Access Configuration

The items in this menu allows you to configure the Remote Access features. Select an item then press <Enter> to display the configuration options.



Remote Access [Enabled]

Enables or disables the remote access feature.
Configuration options: [Disabled] [Enabled]

The following items appear only when **Remote Access** is set to [Enabled].

Serial port number [COM2]

Selects the serial port for console redirection.
Configuration options: [COM1] [COM2]

Base Address. IRQ [2F8h, 3]

This item is not user-configurable and changes with the configuration of Serial port number.

Serial port Mode [57600 8,n,1]

Sets the Serial port mode.
Configuration options: [115200 8,n,1] [57600 8,n,1] [38400 8,n,1] [19200 8,n,1] [09600 8,n,1]

Flow Control [Hardware]

Allows you to select the flow control for console redirection.
Configuration options: [None] [Hardware] [Software]

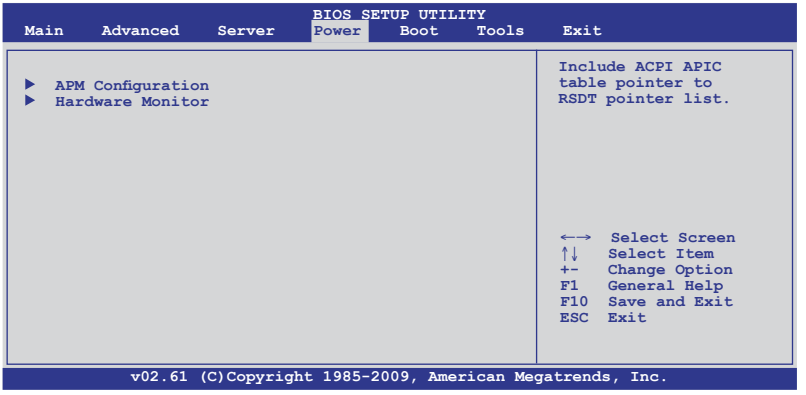
Redirection After BIOS POST [Disabled]

Sets the redirection mode after the BIOS Power-On Self-Test (POST). Some operating system may not work when set to [Always].
Configuration options: [Disabled] [Boot Loader] [Always]

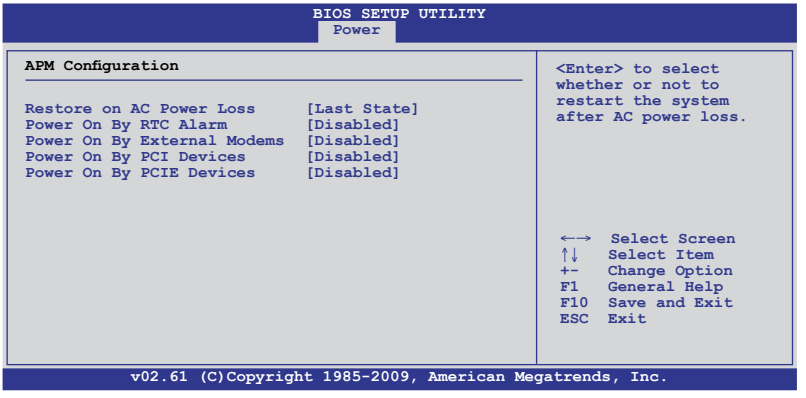
Terminal Type [VT-UTF8]

Allows you to select the target terminal type.
Configuration options: [ANSI] [VT100] [VT-UTF8]

5.6 Power menu



5.6.1 APM Configuration


BIOS SETUP UTILITY
Power
APM Configuration
Restore on AC Power Loss [Last State]
Power On By RTC Alarm [Disabled]
Power On By External Modems [Disabled]
Power On By PCI Devices [Disabled]
Power On By PCIE Devices [Disabled]
<Enter> to select whether or not to restart the system after AC power loss.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Restore on AC Power Loss [Last State]

When set to [Power Off], the system goes into off state after an AC power loss. When set to [Power On], the system will reboot after an AC power loss. When set to [Last State], the system goes into either off or on state, whatever the system state was before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake-up event.
Configuration options: [Disabled] [Enabled]

The following items appear only when the **Resume On RTC Alarm** item is set to [Enabled].

RTC Alarm Date [15]

To set the alarm date, highlight this item and press the <+> or <-> key to make the selection.

System Time [12:30:30]

Use the <ENTER>, <TAB> or <SHIFT-TAB> key to select a field. Use the <+> or <-> key to configure alarm time.

Power On By External Modems [Disabled]

[Disabled] Disables to power up the computer when the external modem receives a call while the computer is in Soft-off mode.

[Enabled] The computer could be powered up when the external modem receives a call while the computer is in Soft-off mode.

The computer cannot receive or transmit data until the computer and applications are fully running. Thus, connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that turns the system power on.

Power On By PCI Devices [Disabled]

[Disabled] Disables the PME to wake up from S5 by PCI devices.

[Enabled] Allows you to turn on the system through a PCI LAN or modem card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

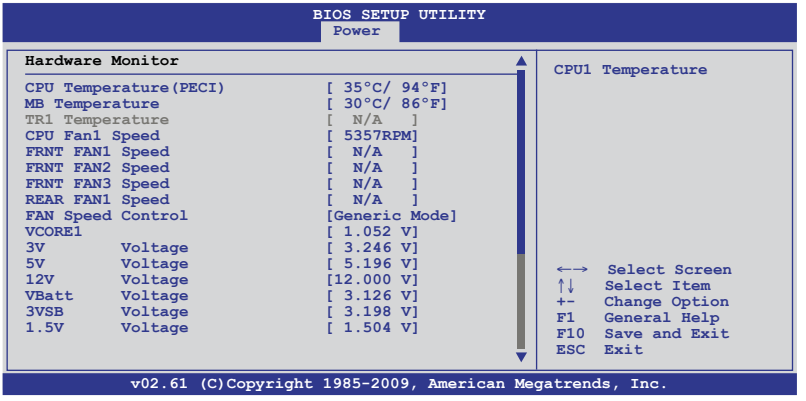
Power On By PCIE Devices [Disabled]

Allows you to enable or disable the PCIE devices to generate a wake event.

[Disabled] Disables the PCIE devices to generate a wake event.

[Enabled] Enables the PCIE devices to generate a wake event.

5.6.2 Hardware Monitor


BIOS SETUP UTILITY
Power
Hardware Monitor
CPU Temperature(PECI) [35°C/ 94°F]
MB Temperature [30°C/ 86°F]
TR1 Temperature [N/A]
CPU Fan1 Speed [5357RPM]
FRNT FAN1 Speed [N/A]
FRNT FAN2 Speed [N/A]
FRNT FAN3 Speed [N/A]
REAR FAN1 Speed [N/A]
FAN Speed Control [Generic Mode]
VCORE1 [1.052 V]
3V Voltage [3.246 V]
5V Voltage [5.196 V]
12V Voltage [12.000 V]
VBatt Voltage [3.126 V]
3VSB Voltage [3.198 V]
1.5V Voltage [1.504 V]
CPU1 Temperature
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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CPU1/MB1/TR1 Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the motherboard component and CPU temperatures. Select [Ignored] if you do not wish to display the detected temperatures.

CPU Fan1; Front Fan1–3 Speed [xxxxRPM] or [Ignored] / [N/A] Rear Fan1 Speed [xxxxRPM] or [Ignored] / [N/A]

The onboard hardware monitor automatically detects and displays the speed of CPU fans, front fans, and rear fans in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows [N/A].

Fan Speed Control [Generic Mode]

Allows you to configure the ASUS Smart Fan feature that smartly adjusts the fan speeds for more efficient system operation.
Configuration options: [Full Speed Mode] [High Density Mode] [Generic Mode] [Whisper Mode]

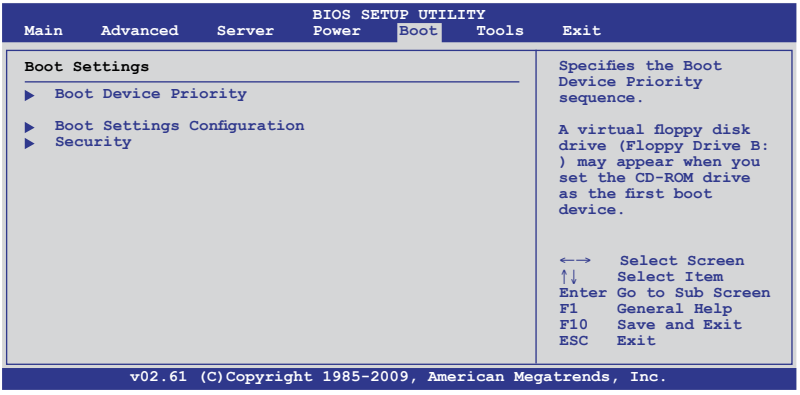
The default setting for the RS100-E6/PI2 server is [Whisper Mode].

VCORE1, 3.3V Voltage, 5V Voltage, 12V Voltage, VBatt Voltage, 3VSB Voltage, 1.5V Voltage

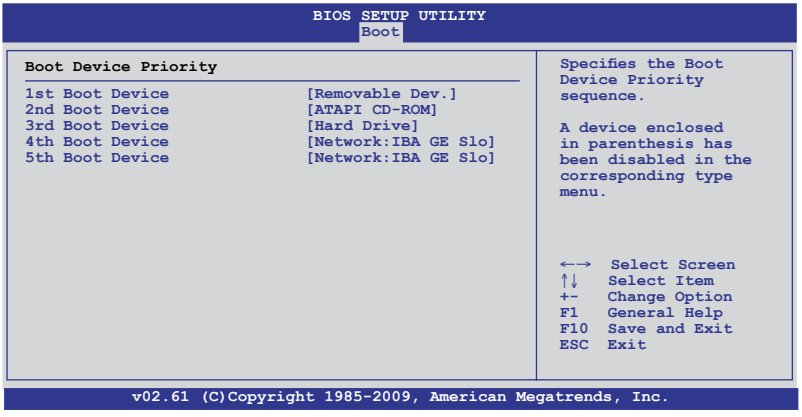
The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select [Ignored] if you do not want to detect this item.

5.7 Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.


BIOS SETUP UTILITY
Main Advanced Server Power Boot Tools Exit
Boot Settings
Boot Device Priority
Boot Settings Configuration
Security
Specifies the Boot Device Priority sequence.
A virtual floppy disk drive (Floppy Drive B:) may appear when you set the CD-ROM drive as the first boot device.
←→ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2009, American Megatrends, Inc.

5.7.1 Boot Device Priority


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [Removable Dev.]
2nd Boot Device [ATAPI CD-ROM]
3rd Boot Device [Hard Drive]
4th Boot Device [Network:IBA GE Slo]
5th Boot Device [Network:IBA GE Slo]
Specifies the Boot Device Priority sequence.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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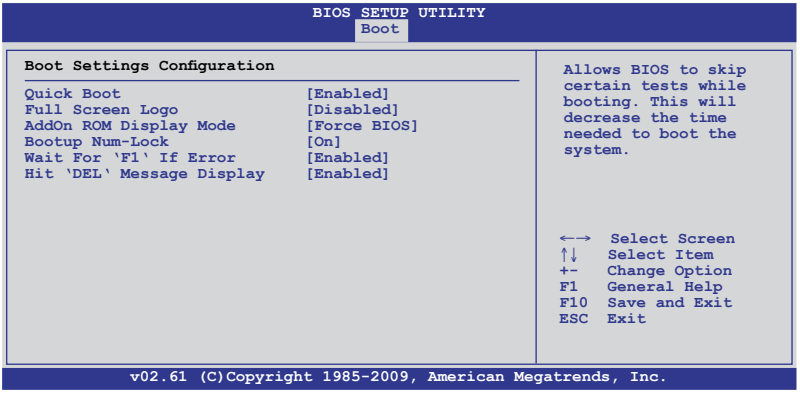
1st ~ xxth Boot Device [XXXXXXX]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.
Configuration options: [xxxxx Drive] [Disabled]

5.7.2 Hard Disk Drives; CDROM Drives

These two items appear only when you install more than two hard disk drives or optical drives to you system. These items allows you to specify the boot priority sequence of the hard disk drives or the optical drives.

5.7.3 Boot Settings Configuration


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Full Screen Logo [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.
Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

Allows you to enable or disable the full screen logo display feature.
Configuration options: [Disabled] [Enabled]

Set this item to [Enabled] to use the ASUS MyLogo2™ feature.

AddOn ROM Display Mode [Force BIOS]

Allows you to set the display mode for Options ROM.
Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

Wait For 'F1' If Error [Enabled]

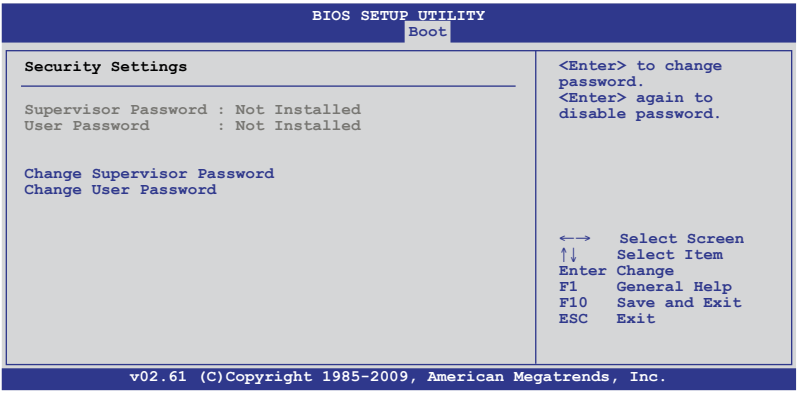
When set to [Enabled], the system waits for the <F1> key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

When set to [Enabled], the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

5.7.4 Security

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.



Change Supervisor Password

Select this item to set or change the supervisor password. The **Supervisor Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a Supervisor Password:

1. Select the **Change Supervisor Password** item and press <Enter>.
2. From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

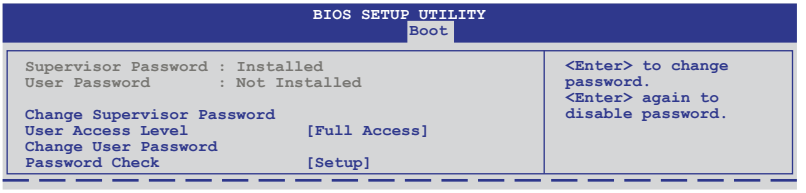
The message “Password Installed” appears after you successfully set your password.

To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the **Change Supervisor Password** then press <Enter>. The message “Password Uninstalled” appears.

If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **4.2 Jumpers** for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.



User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.

View Only allows access but does not allow change to any field.

Limited allows changes only to selected fields, such as Date and Time.

Full Access allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows Installed.

To set a User Password:

1. Select the **Change User Password** item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message “Password Installed” appears after you set your password successfully.

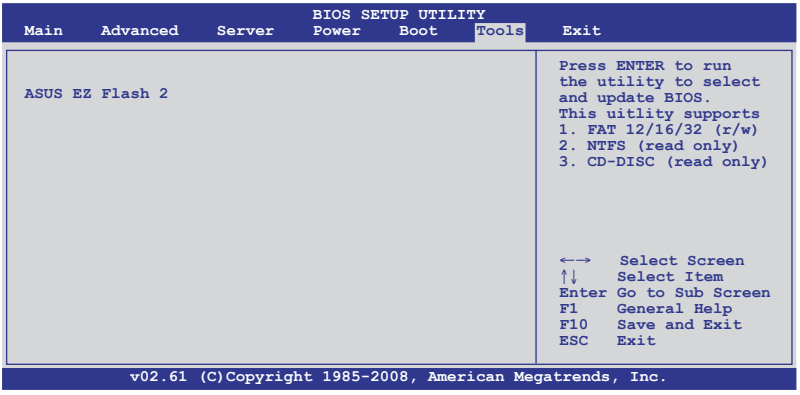
To change the user password, follow the same steps as in setting a user password.

Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system. Configuration options: [Setup] [Always]

5.8 Tools menu

The Tools menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.


BIOS SETUP UTILITY
Main Advanced Server Power Boot Tools Exit
ASUS EZ Flash 2
Press ENTER to run the utility to select and update BIOS.
This uitlity supports
1. FAT 12/16/32 (r/w)
2. NTFS (read only)
3. CD-DISC (read only)
←→ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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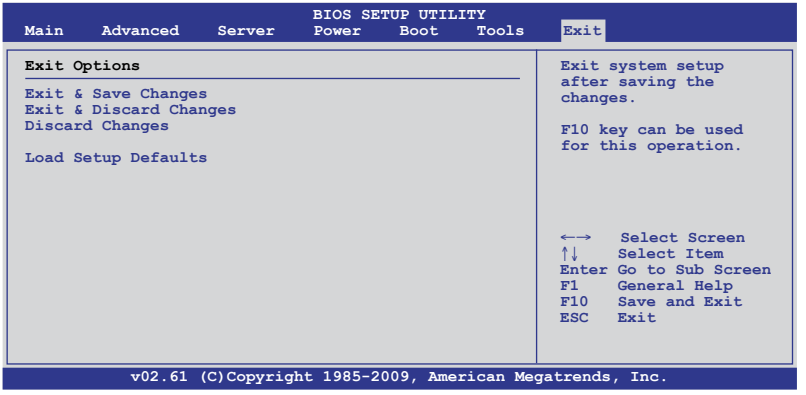
5.8.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice. Check section **5.1.1 ASUS EZ Flash 2 utility** for details.

5.9 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.


BIOS SETUP UTILITY
Main Advanced Server Power Boot Tools Exit
Exit Options
Exit & Save Changes
Exit & Discard Changes
Discard Changes
Load Setup Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
←→ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2009, American Megatrends, Inc.

Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **YES** to save changes and exit.

If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select **YES** to discard any changes and load the previously saved values.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **YES** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

Chapter 6

This chapter provides instructions for setting up, creating and configuring RAID sets using the available utilities.

RAID configuration

6.1 Setting up RAID

The motherboard comes with the Intel® 3420 southbridge controller that supports the following SATA RAID solutions:

- **LSI MegaRAID software RAID Configuration Utility** (default) with RAID 0, RAID 1, and RAID 10 support (for both Linux and Windows OS).
- **Intel Matrix Storage Manager** with RAID 0, RAID 1, RAID 10, and RAID 5 support (for Windows OS only).

6.1.1 RAID definitions

RAID 0 *(Data striping)* optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 *(Data mirroring)* copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 10 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

RAID 5 stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

6.1.2 Installing hard disk drives

The motherboard supports SATA hard disk drives for RAID set configuration. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

See section **2.4 Hard disk drives** for SATA hard disk drive installation.

6.1.3 RAID controller selection

You can choose either the LSI Software RAID Configuration Utility or the Intel Matrix Storage Manager as the default utility to create RAID set(s). See **5. RAID configuration utility selection** on page 4-6 for details.

6.1.4 Setting the RAID item in BIOS

You must set the RAID item in the BIOS Setup before you can create a RAID set from SATA hard disk drives attached to the SATA connectors supported by Intel® 3420 chipset. To do this:

1. Enter the BIOS Setup during POST.
2. Go to the **Main** menu > **Storage Configuration**, and then press <Enter>.
3. Set the **Configure SATA as** item to [RAID].
4. Press <F10> to save your changes and exit the BIOS Setup.

Refer to Chapter 5 for details on entering and navigating through the BIOS Setup.

6.2 LSI Software RAID Configuration Utility

The LSI MegaRAID software RAID configuration utility allows you to create RAID 0, RAID 1, or RAID 10 set(s) from SATA hard disk drives connected to the SATA connectors supported by the motherboard southbridge chip.

To enter the LSI MegaRAID software RAID configuration utility

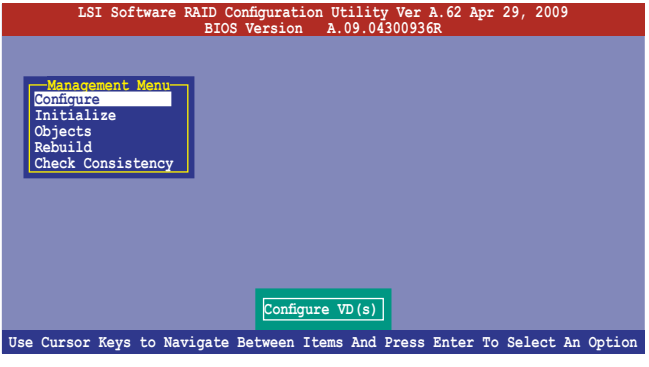
1. Turn on the system after installing all the SATA hard disk drives.
2. During POST, the LSI MegaRAID software RAID configuration utility automatically detects the installed SATA hard disk drives and displays any existing RAID set(s). Press <Ctrl> + <M> to enter the utility.

```
LSI MegaRAID Software RAID BIOS Version A.09 04300936R
LSI SATA RAID Found at PCI Bus No: Dev No:1F
Device present at Port 0     ST3160812AS      152114MB
Device present at Port 1     ST3160812AS      152114MB
Device present at Port 2     ST3160812AS      152114MB
Device present at Port 3     ST3160812AS      152114MB
Press Ctrl-M or Enter to run LSI Software RAID Setup Utility.
```

- The LSI MegaRAID software RAID configuration utility automatically configures to RAID 1 when the SATA to RAID Mode is enabled.
- The RAID setup screens shown in this section are for reference only and may not exactly match the items on your screen due to the controller version difference.
- When you create RAID sets with the LSI MegaRAID software RAID configuration utility, the boot priority of the SATA optical drive has to be manually adjusted. Otherwise, the system will not boot from the connected SATA ODD.

3. The utility main window appears. Use the arrow keys to select an option from the **Management Menu** and then press <Enter>. Refer to the Management Menu descriptions on the next page.

   At the bottom of the screen is the legend box. The keys on the legend box allow you to navigate through the setup menu options or execute commands. The keys on the legend box vary according to the menu level.



Menu	Description
Configure	Allows you to create RAID 0, RAID 1 or RAID 10 set using the Easy Configuration or the New Configuration command. This menu also allows you to view, add, or clear RAID configurations or select the boot drive
Initialize	Allows you to initialize the virtual drives of a created RAID set
Objects	Allows you to initialize virtual drives or change the virtual drive parameters
Rebuild	Allows you to rebuild failed drives
Check Consistency	Allows you to check the data consistency of the virtual drives of a created RAID set

6.2.1 Creating a RAID set

The LSI Software RAID Configuration Utility allows you to create a RAID 0, RAID 1, or RAID 10 set using two types of configurations: **Easy** and **New**.

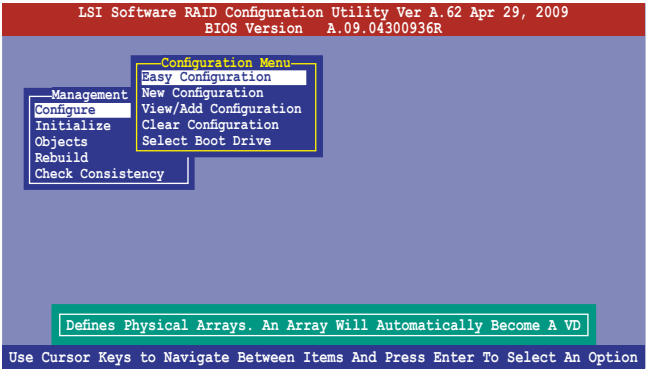
In **Easy Configuration**, the virtual drive parameters are set automatically.

In **New Configuration**, you manually set the virtual drive parameters.

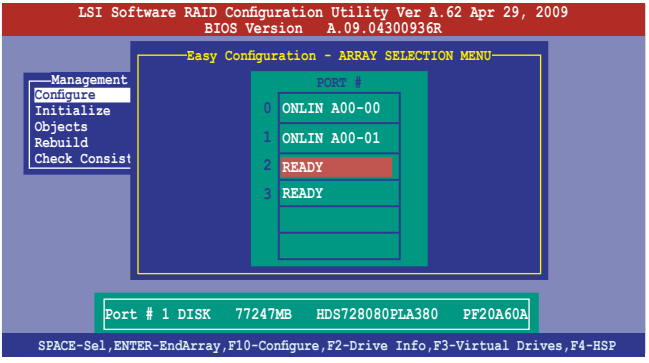
Using Easy Configuration

To create a RAID set using the **Easy Configuration** option

1. From the **Management Menu**, select **Configure > Easy Configuration**, and then press <Enter>.

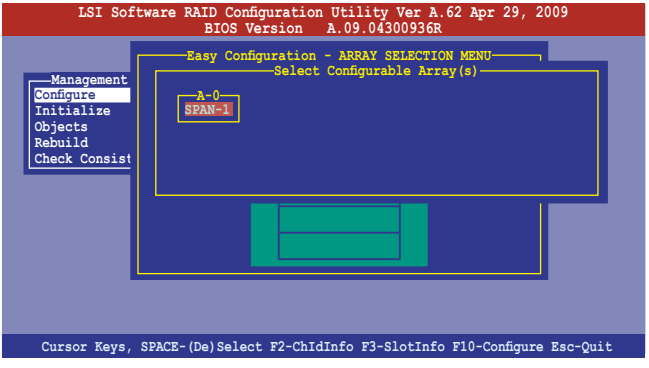


2. The **ARRAY SELECTION MENU** displays the available drives connected to the SATA ports. Use the up/down arrow key to select the drives you want to include in the RAID set, and then press <Space>. When selected, the drive indicator changes from **READY** to **ONLIN A[X]-[Y]**, where X is the array number, and Y is the drive number.

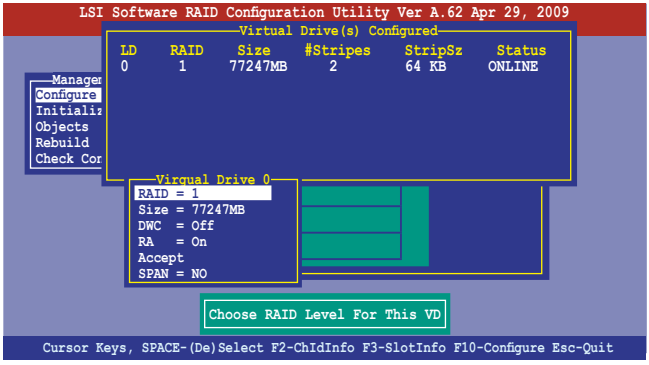


- The information of the selected hard disk drive displays at the bottom of the screen.
- You need at least two identical hard disk drives when creating a RAID 1 set.
- You need at least four identical hard disk drives when creating a RAID 10 set.

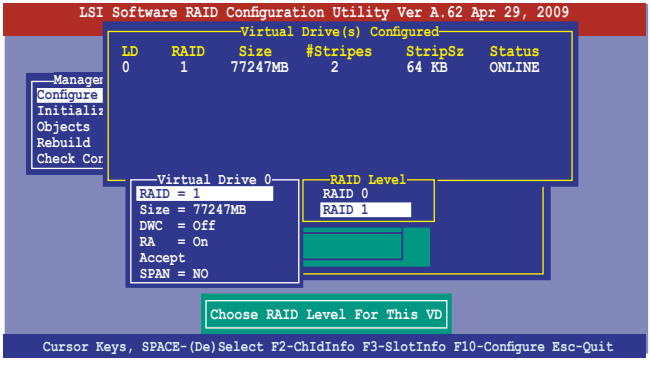
3. Select all the drives required for the RAID set, and then press <F10> to configure array setting.
4. Press <Space> to select the configurable array.



5. Press <F10> again, the virtual drive information appears including a **Virtual Drive** menu that allows you to change the virtual drive parameters.



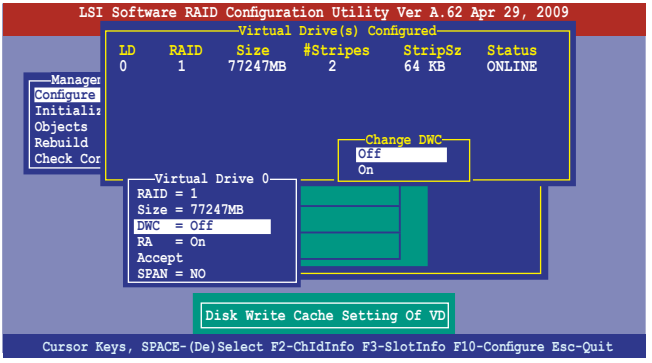
6. Select **RAID** from the **Virtual Drive** sub-menu, and then press <Enter>.
7. Select the **RAID** level from the menu, and then press <Enter>.



8. When creating a **RAID 1** or a **RAID 10** set, select **DWC** from the **Virtual Drive** menu, and then press <Enter>.

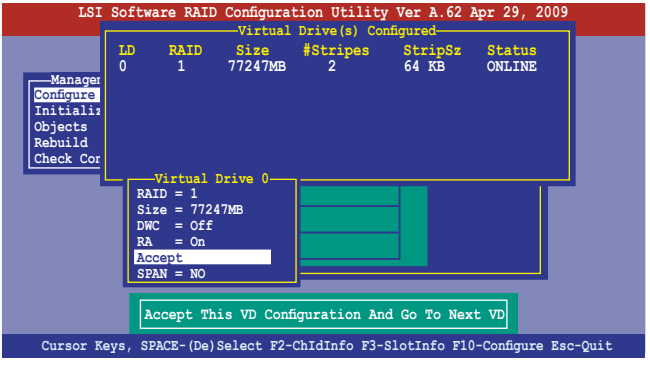
   When creating a **RAID 0** set, proceed to step 10.

9. Select **On** to enable the **Disk Write Cache** setting, and then press <Enter>.

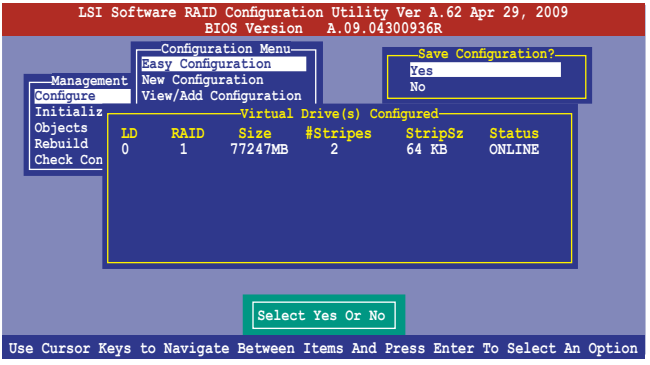


Enabling DWC can improve the performance, but with the risk of data loss.

10. When finished setting the selected virtual drive configuration, select **Accept** from the menu, and then press <Enter>.



11. Follow step 2 to 10 to configure additional virtual drives.
12. Press <Esc> to finish RAID configuration. When prompted to save configuration, select **Yes** from the menu, and then press <Enter>.

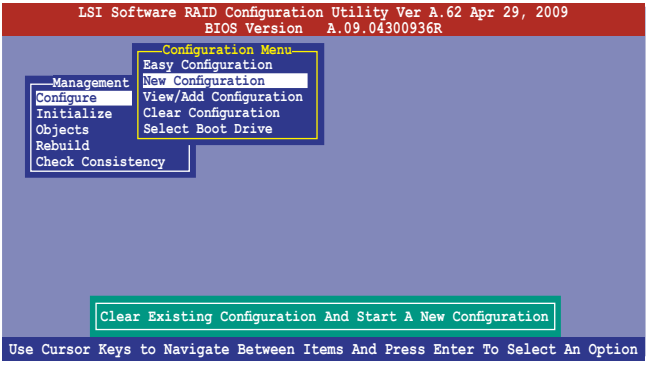


Using New Configuration

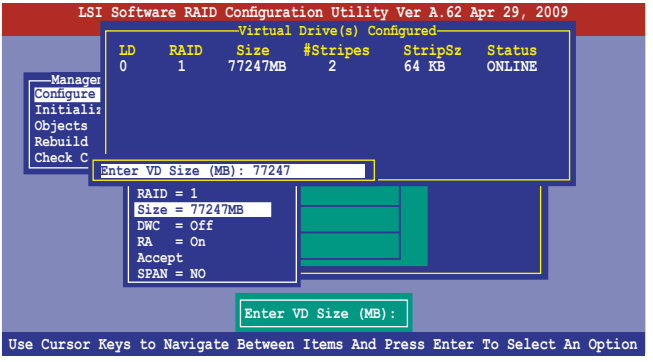
When a RAID set already exists, using the **New Configuration** command erases the existing RAID configuration data. If you do not want to delete the existing RAID set, use the **View/Add Configuration** command to view or create another RAID configuration.

To create a RAID set using the **New Configuration** option

1. From the **Management Menu**, select **Configure > New Configuration,** and then press <Enter>.



2. Follow step 2 to 7 of the previous section: **Using Easy Configuration**.
3. Select **Size** from the **Virtual Drive** menu, and then press <Enter>.
4. Key-in the desired virtual drive size, and then press <Enter>.



5. Follow step 8 to 12 of the previous section: **Using Easy Configuration** to create the RAID set.

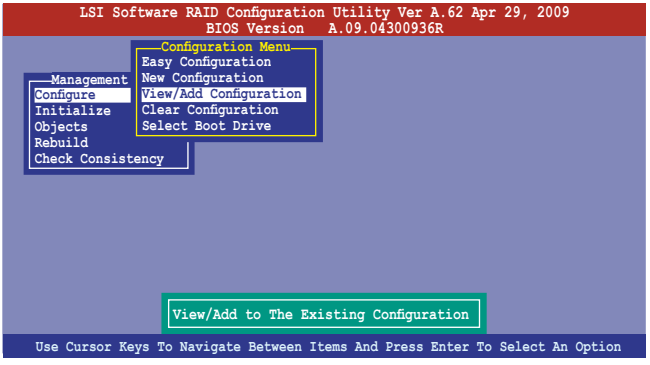
6.2.2 Adding or viewing a RAID configuration

You can add a new RAID configuration or view an existing configuration using the **View/Add Configuration** command.

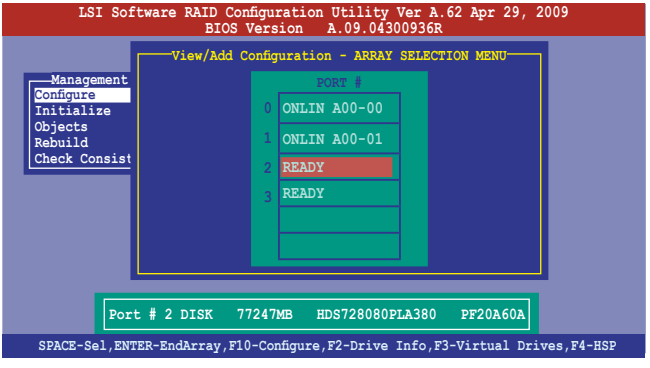
Adding a new RAID configuration

To add a new RAID configuration:

1. From the **Management Menu**, select **Configure > View/Add Configuration**, and then press <Enter>.



2. The **ARRAY SELECTION MENU** displays the available drives connected to the SATA ports. Select the drive(s) you want to include in the RAID set, then press <Space>. When selected, the drive indicator changes from **READY** to **ONLIN A[X]-[Y]**, where X is the array number, and Y is the drive number.



The information of the selected hard disk drive displays at the bottom of the screen.

3. Follow step 3 to 12 of section **6.2.1 Creating a RAID set: Using Easy Configuration** to add a new RAID set.

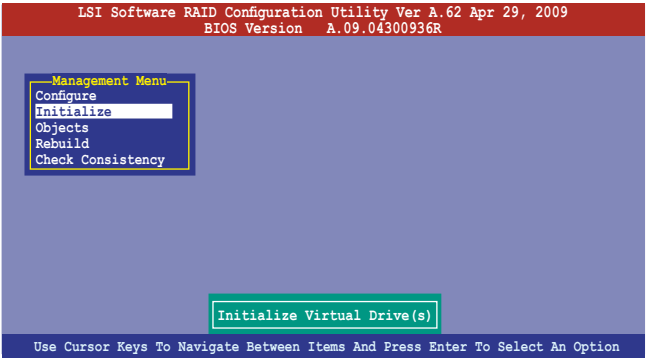
6.2.3 Initializing the virtual drives

After creating the RAID set(s), you must initialize the virtual drives. You may initialize the virtual drives of a RAID set(s) using the **Initialize** or **Objects** command on the **Management Menu**.

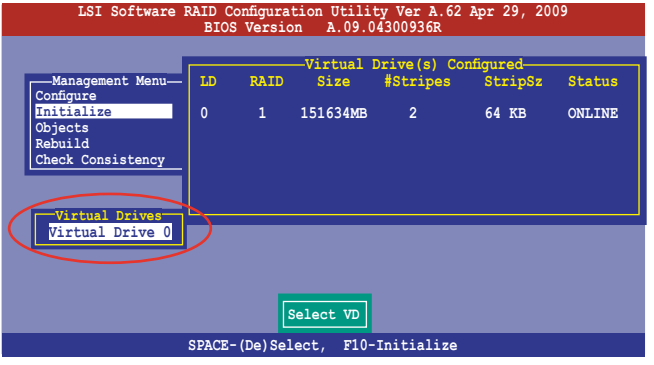
Using the Initialize command

To initialize the virtual drive using the Initialize command

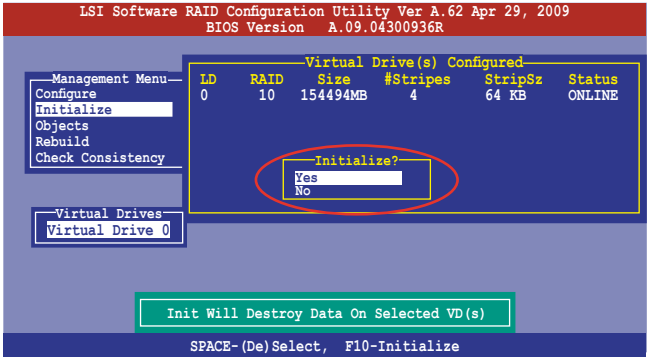
1. From the **Management Menu**, select **Initialize**, and then press <Enter>.



2. The screen displays the available RAID set(s) and prompts you to select the virtual drive to initialize. Use the arrow keys to select the virtual drive from the **Virtual Drive** selection, and then press <Space>.

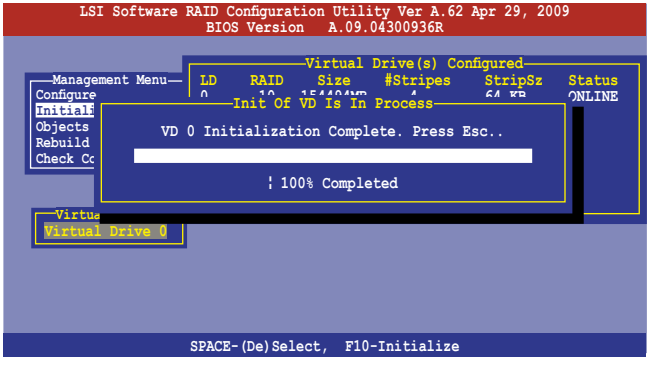


3. Press <F10> to start initialization. When prompted, select **Yes** from the **Initialize?** dialog box, and then press <Enter>.



Initializing a virtual drive erases all data on the drive.

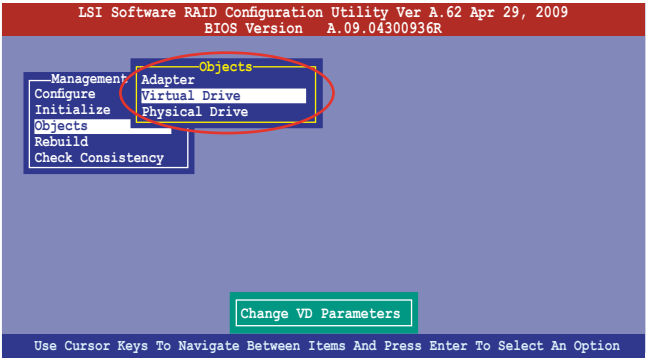
4. A progress bar appears on screen. If desired, press <Esc> to abort initialization. When initialization is completed, press <Esc>.


LSI Software RAID Configuration Utility Ver A.62 Apr 29, 2009
BIOS Version A.09.04300936R
Management Menu
Virtual Drive(s) Configured
LD RAID Size #Stripes StripSz Status
Init Of VD Is In Process
VD 0 Initialization Complete. Press Esc..
100% Completed
Virtual Drive 0
SPACE-(De)Select, F10-Initialize

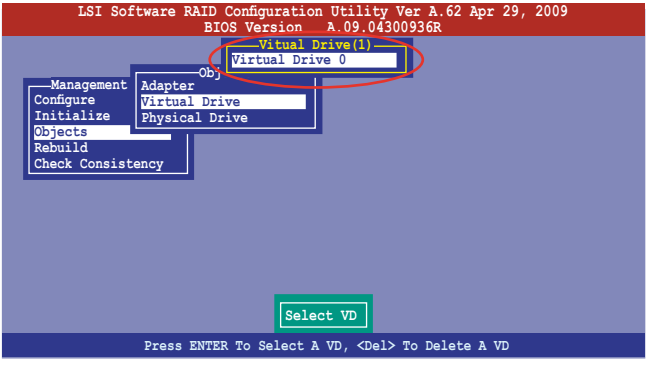
Using the Objects command

To initialize the virtual drives using the **Objects** command

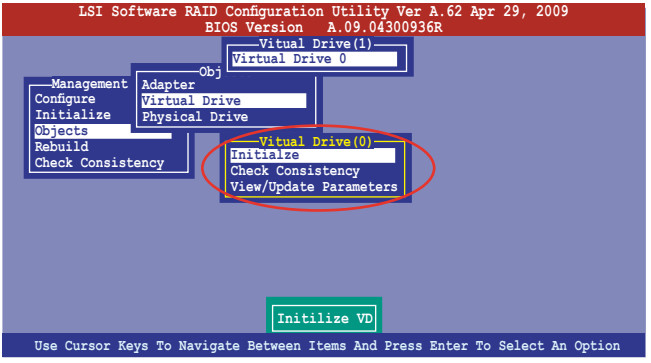
1. From the **Management Menu**, select **Objects > Virtual Drive**, and then press <Enter>.



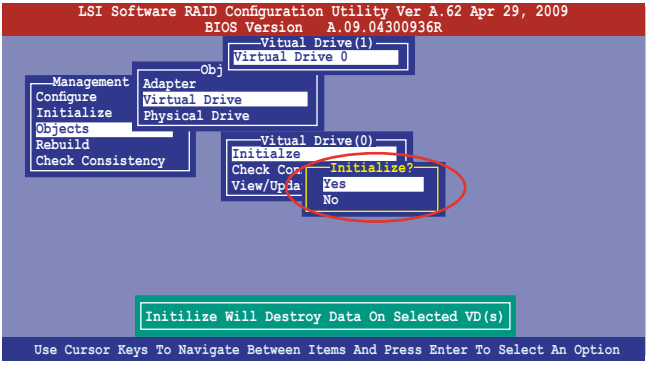
2. Select the virtual drive to initialize from the **Virtual Drives** sub-menu, and then press <Enter>.



3. Select **Initialize** from the pop-up menu, and then press <Enter> to start initialization.



4. When prompted, press the <Space> to select **Yes** from the **Initialize?** dialog box, and then press <Enter>.



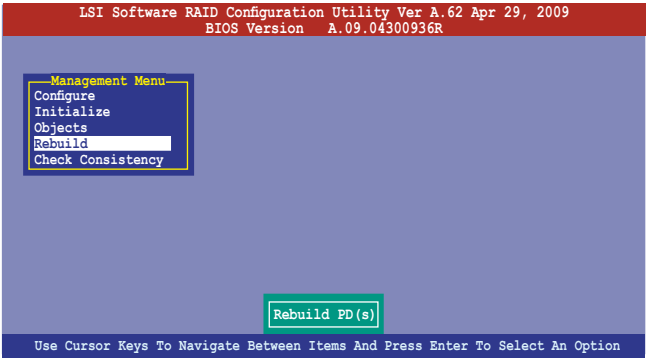
5. A progress bar appears on screen. If desired, press <Esc> to abort initialization. When initialization is completed, press <Esc>.

6.2.4 Rebuilding failed drives

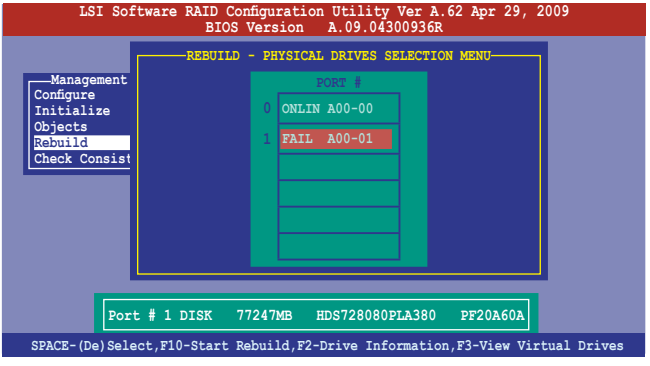
You can manually rebuild failed hard disk drives using the **Rebuild** command in the **Management Menu**.

To rebuild a failed hard disk drive

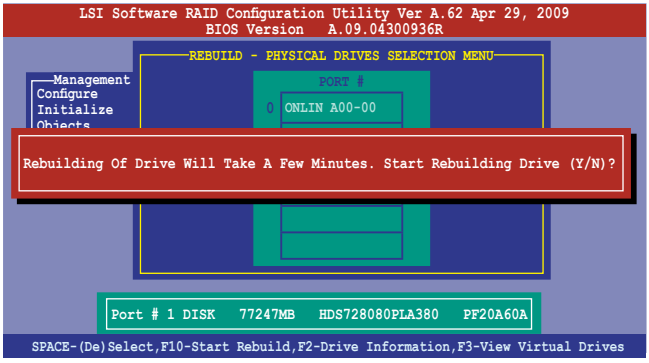
1. From the **Management Menu**, select **Rebuild**, and then press <Enter>.



2. The **PHYSICAL DRIVES SELECTION MENU** displays the available drives connected to the SATA ports. Select the drive you want to rebuild, and then press <Space>.



3. After selecting the drive to rebuild, press <F10>. When prompted, press <Y> to rebuild the drive.


LSI Software RAID Configuration Utility Ver A.62 Apr 29, 2009
BIOS Version A.09.04300936R
REBUILD - PHYSICAL DRIVES SELECTION MENU
Management
Configure
Initialize
Objects
PORT #
0 ONLIN A00-00
Rebuilding Of Drive Will Take A Few Minutes. Start Rebuilding Drive (Y/N)?
Port # 1 DISK 77247MB HDS728080PLA380 PF20A60A
SPACE-(De)Select,F10-Start Rebuild,F2-Drive Information,F3-View Virtual Drives

4. When rebuild is complete, press any key to continue.

6.2.5 Checking the drives for data consistency

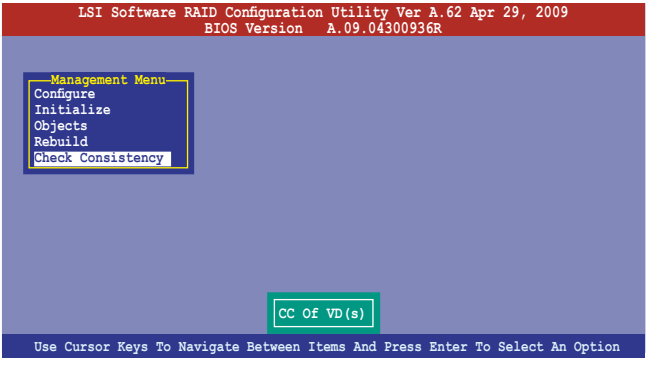
You can check and verify the accuracy of data redundancy in the selected virtual drive. The utility can automatically detect and/or detect and correct any differences in data redundancy depending on the selected option in the **Objects > Adapter** menu.

The **Check Consistency** command is available only for virtual drives included in a RAID 1 or RAID 10 set.

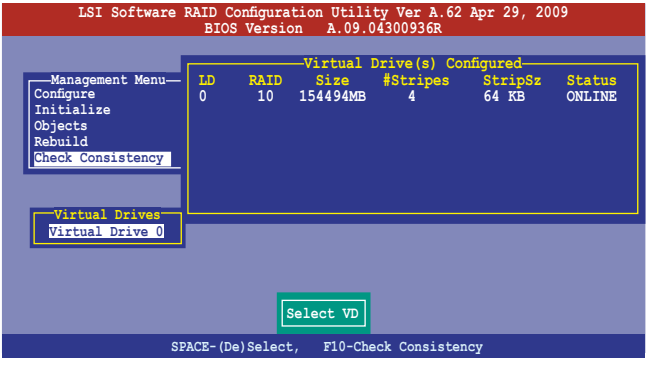
Using the Check Consistency Command

To check data consistency using the **Check Consistency** command

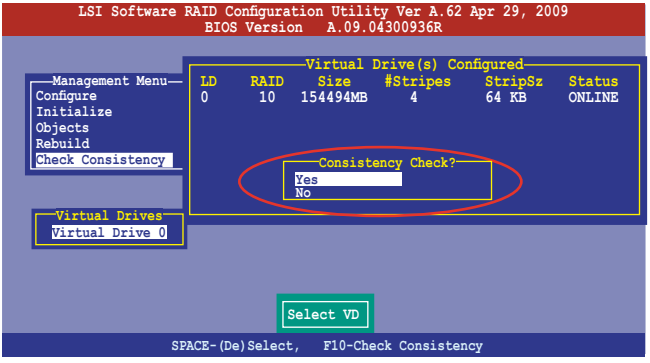
1. From the **Management Menu**, select **Check Consistency**, and then press <Enter>.



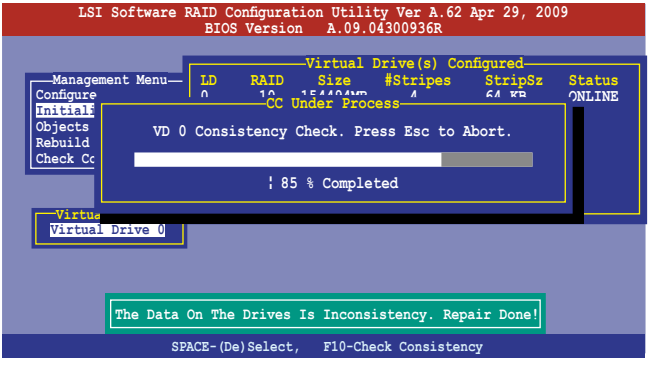
2. The screen displays the available RAID set(s) and prompts you to select the virtual drive to check. Press <Space> to select the virtual drive from the **Virtual Drive** sub-menu, and then press <F10>.



3. When prompted, use the arrow keys to select **Yes** from the **Consistency Check?** dialog box, and then press <Enter>.



A progress bar appears on screen.


LSI Software RAID Configuration Utility Ver A.62 Apr 29, 2009
BIOS Version A.09.04300936R
Management Menu
Virtual Drive(s) Configured
LD RAID Size #Stripes StripSz Status
CC Under Process
VD 0 Consistency Check. Press Esc to Abort.
85 % Completed
Virtual Drive 0
The Data On The Drives Is Inconsistency. Repair Done!
SPACE-(De)Select, F10-Check Consistency

4. While checking the disk consistency, press <Esc> to display the following options.
   - **Stop** - Stops the consistency check. The utility stores the percentage of disk checked, and when you restart checking, it continues from the last percentage completed rather than from zero percent.
   - **Continue** - Continues the consistency check.
   - **Abort** - Aborts the consistency check. When you restart checking, it continues from zero percent.

5. When checking is complete, press any key to continue.

Using the Objects command

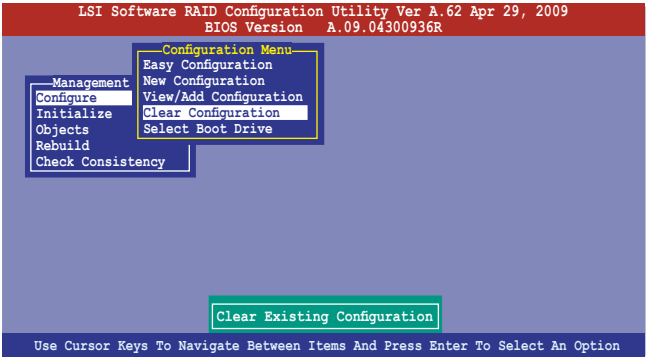
To check data consistency using the **Objects** command

1. From the **Management Menu**, select **Objects**, and then select **Virtual Drive** from the sub-menu.
2. Use the arrow keys to select the virtual drive you want to check, and then press <Enter>.
3. Select **Check Consistency** from the pop-up menu, and then press <Enter>.
4. When prompted, use the arrow keys to select **Yes** from the dialog box to check the drive.
5. When checking is complete, press any key to continue.

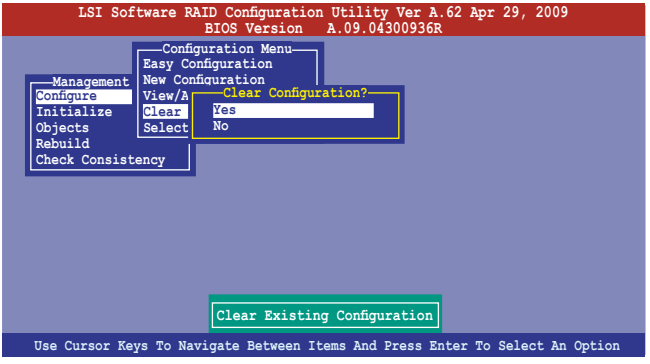
6.2.6 Deleting a RAID configuration

To delete a RAID configuration

1. From the **Management Menu**, select **Configure** > **Clear Configuration**, and then press <Enter>.



2. When prompted, use the arrow keys to select **Yes** from the **Clear Configuration?** dialog box, and then press <Enter>.



The utility clears all the current array(s).

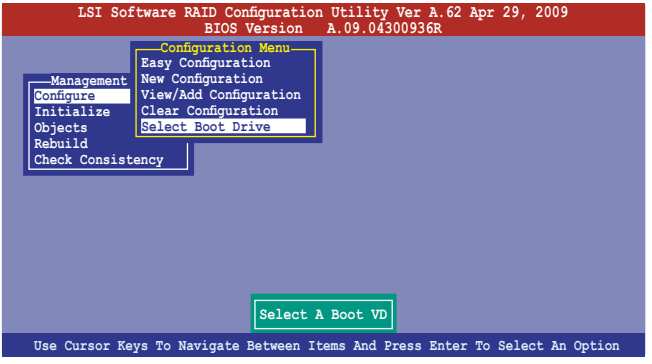
3. Press any key to continue.

6.2.7 Selecting the boot drive from a RAID set

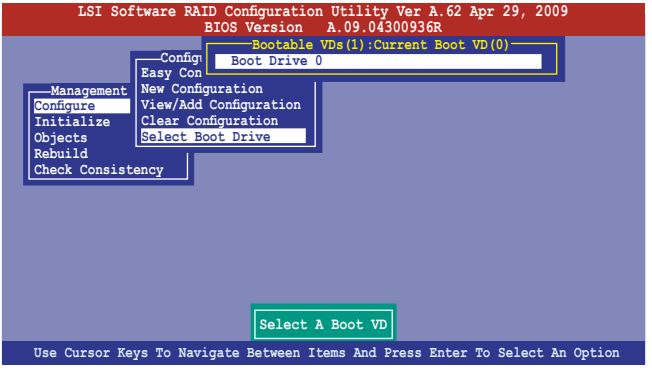
You must have created a new RAID configuration before you can select the boot drive from a RAID set. See section **6.2.1 Creating a RAID set: Using New Configuration** for details.

To select the boot drive from a RAID set

1. From the **Management Menu**, select **Configure** > **Select Boot Drive**, and then press <Enter>.



2. When prompted, use the arrow keys to select the bootable virtual drive from the list, then press <Enter>.



3. The virtual drive is selected as boot drive. Press any key to continue.

6.2.8 Enabling WriteCache

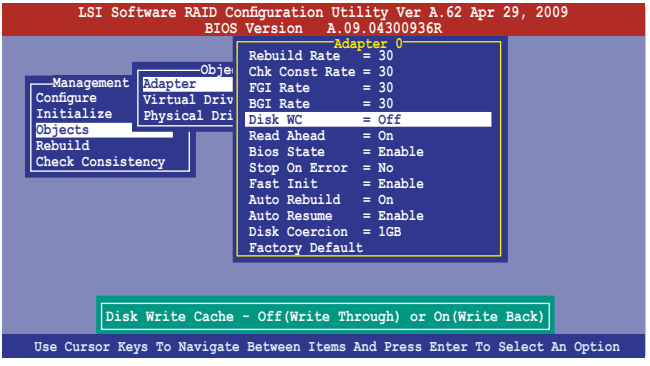
You may manually enable the RAID controller's WriteCache option after creating a RAID set to improve the data transmission performance.

When you enable WriteCache, you may lose data when a power interruption occurs while transmitting or exchanging data among the drives.

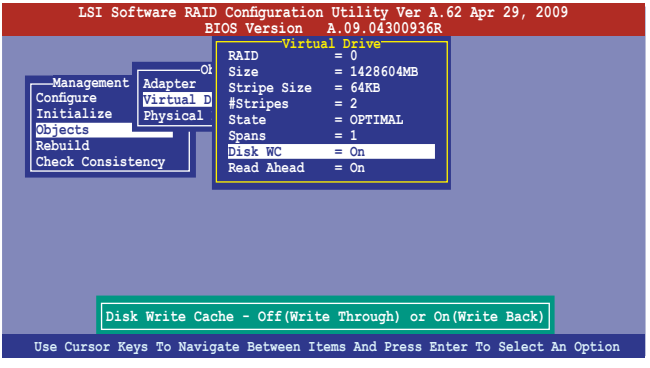
The WriteCache function is recommended for RAID 1 and RAID 10 sets.

To enable WriteCache

1. From the **Management Menu**, select **Objects** > **Adapter**, and then press <Enter> to display the adapter properties.
2. Select **Disk WC**, and then press <Enter> to turn on the option.



3. From the **Management Menu**, select **Objects** > **Virtual Drive**, and then press <Enter> to display the adapter properties.
4. Select **Disk WC**, and then press <Enter> to turn on the option.



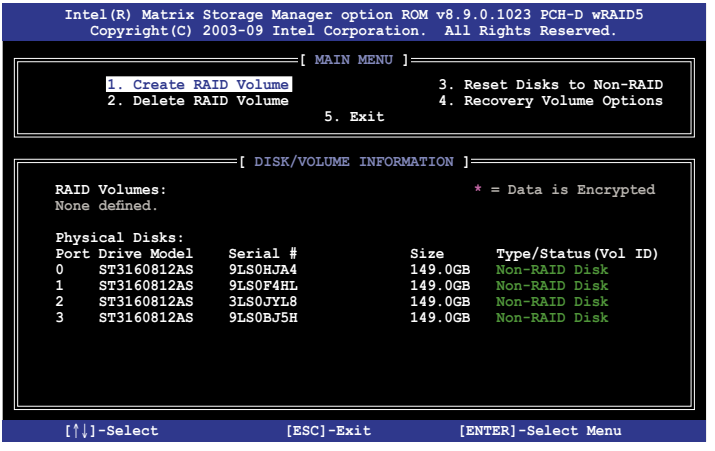
5. When finished, press any key to continue.

6.3 Intel® Matrix Storage Manager Option ROM Utility

The Intel® Matrix Storage Manager Option ROM utility allows you to create RAID 0, RAID 1, RAID 10 (RAID 1+0), and RAID 5 set(s) from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

To enter the Intel® Matrix Storage Manager option ROM utility:

1. Install all the Serial ATA hard disk drives.
2. Turn on the system.
3. During POST, press <Ctrl+I> to display the utility main menu.


Intel(R) Matrix Storage Manager option ROM v8.9.0.1023 PCH-D wRAID5
Copyright(C) 2003-09 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Recovery Volume Options
5. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
* = Data is Encrypted
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
0 ST3160812AS 9LS0HJA4 149.0GB Non-RAID Disk
1 ST3160812AS 9LS0F4HL 149.0GB Non-RAID Disk
2 ST3160812AS 3LS0JYL8 149.0GB Non-RAID Disk
3 ST3160812AS 9LS0BJ5H 149.0GB Non-RAID Disk
[↑↓]-Select
[ESC]-Exit
[ENTER]-Select Menu

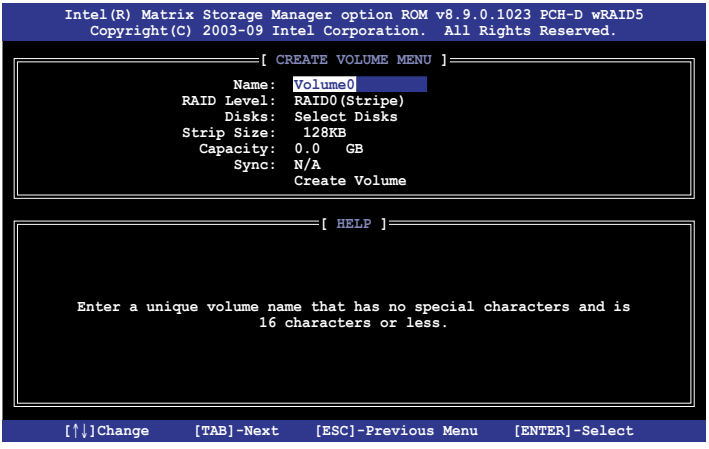
The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

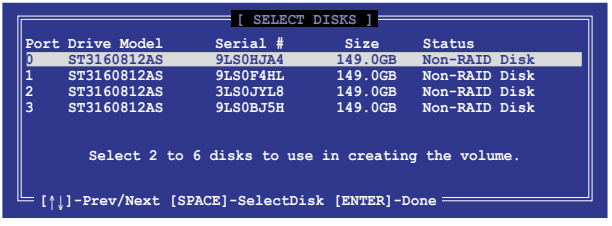
6.3.1 Creating a RAID set

To create a RAID set

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears.


Intel(R) Matrix Storage Manager option ROM v8.9.0.1023 PCH-D wRAID5
Copyright(C) 2003-09 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 0.0 GB
Sync: N/A
Create Volume
[HELP]
Enter a unique volume name that has no special characters and is 16 characters or less.
[↑↓]Change [TAB]-Next [ESC]-Previous Menu [ENTER]-Select

2. Enter a name for the RAID set and press <Enter>.
3. When the **RAID Level** item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.
4. When the **Disks** item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The **SELECT DISKS** screen appears.


[SELECT DISKS]
Port Drive Model Serial # Size Status
0 ST3160812AS 9LS0HJA4 149.0GB Non-RAID Disk
1 ST3160812AS 9LS0F4HL 149.0GB Non-RAID Disk
2 ST3160812AS 3LS0JYL8 149.0GB Non-RAID Disk
3 ST3160812AS 9LS0BJ5H 149.0GB Non-RAID Disk
Select 2 to 6 disks to use in creating the volume.
[↑↓]-Prev/Next [SPACE]-SelectDisk [ENTER]-Done

5. Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

6. Use the up/down arrow key to select the stripe size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The following are typical values:
RAID 0: 128KB
RAID 10: 64KB
RAID 5: 64KB

We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

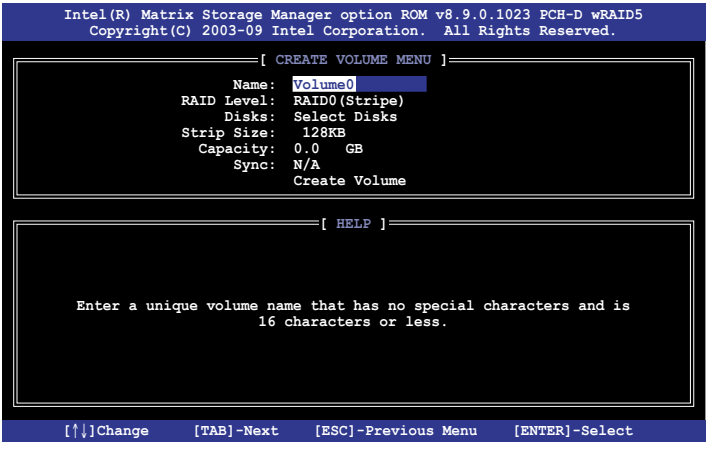
7. When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.
8. When the **Create Volume** item is selected, press <Enter>. The following warning message appears.

9. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the **CREATE VOLUME** menu.

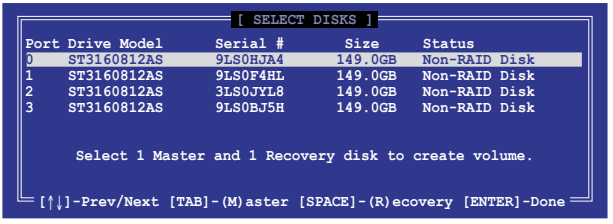
6.3.2 Creating a Recovery set

To create a recovery set

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears.


Intel(R) Matrix Storage Manager option ROM v8.9.0.1023 PCH-D wRAID5
Copyright(C) 2003-09 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 0.0 GB
Sync: N/A
Create Volume
[HELP]
Enter a unique volume name that has no special characters and is 16 characters or less.
[↑↓]Change [TAB]-Next [ESC]-Previous Menu [ENTER]-Select

2. Enter a name for the recovery set and press <Enter>.
3. When the **RAID Level** item is selected, press the up/down arrow key to select **Recovery**, and then press <Enter>.
4. When the **Disks** item is selected, press <Enter> to select the hard disk drives you want to include in the recovery set. The **SELECT DISKS** screen appears.


[SELECT DISKS]
Port Drive Model Serial # Size Status
0 ST3160812AS 9LS0HJA4 149.0GB Non-RAID Disk
1 ST3160812AS 9LS0F4HL 149.0GB Non-RAID Disk
2 ST3160812AS 3LS0JYL8 149.0GB Non-RAID Disk
3 ST3160812AS 9LS0BJ5H 149.0GB Non-RAID Disk
Select 1 Master and 1 Recovery disk to create volume.
[↑↓]-Prev/Next [TAB]-(M)aster [SPACE]-(R)ecovery [ENTER]-Done

5. Use the up/down arrow key to select a drive, press <TAB> to select a Master disk, and then press <SPACE> to select a Recovery disk. A small triangle marks the selected drive. Press <Enter> after completing your selection.
6. When the **Sync** item is selected, use the up/down arrow key to select a sync option that you want and press <Enter>.
7. When the **Create Volume** item is selected, press <Enter>. The following warning message appears.

8. Press <Y> to create the recovery set and return to the main menu, or <N> to go back to the **CREATE VOLUME** menu.

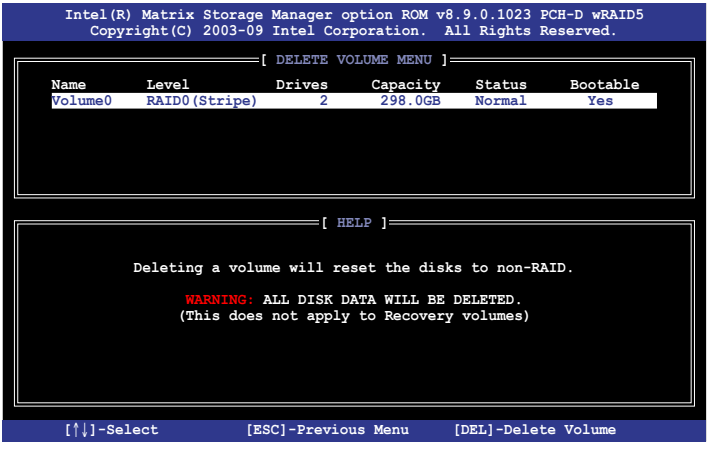
If a recovery set is created, you cannot add more RAID sets even when you have more non-RAID disks installed in your system.

6.3.3 Deleting a RAID set

Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears.


Intel(R) Matrix Storage Manager option ROM v8.9.0.1023 PCH-D wRAID5
Copyright(C) 2003-09 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[HELP]
Deleting a volume will reset the disks to non-RAID.
WARNING: ALL DISK DATA WILL BE DELETED.
(This does not apply to Recovery volumes)
[↑↓]-Select [ESC]-Previous Menu [DEL]-Delete Volume

2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Del>. The following warning message appears.

[DELETE VOLUME VERIFICATION]
ALL DATA IN THE VOLUME WILL BE LOST!
(This does not apply to Recovery volumes)
Are you sure you want to delete volume "Volume0"? (Y/N):

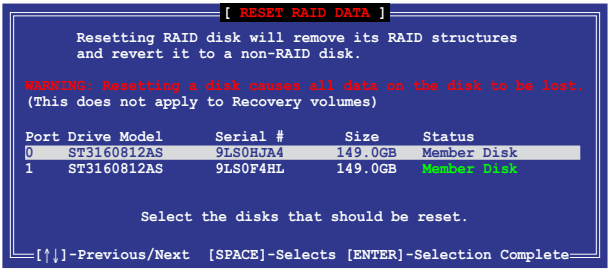
3. Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to return to the **DELETE VOLUME** menu.

6.3.4 Resetting disks to Non-RAID

Take caution before you reset a RAID volume hard disk drive to non-RAID. Resetting a RAID volume hard disk drive deletes all internal RAID structure on the drive.

To reset a RAID set hard disk drive

1. From the utility main menu, select **3. Reset Disks to Non-RAID** and press <Enter>. The following screen appears.


[RESET RAID DATA]
Resetting RAID disk will remove its RAID structures
and revert it to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
(This does not apply to Recovery volumes)
Port Drive Model Serial # Size Status
0 ST3160812AS 9LS0HJA4 149.0GB Member Disk
1 ST3160812AS 9LS0F4HL 149.0GB Member Disk
Select the disks that should be reset.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete

2. Use the up/down arrow key to select the RAID set drive(s) you want to reset, and then press <Space> to select.
3. Press <Enter> to reset the RAID set drive(s). A confirmation message appears.
4. Press <Y> to reset the drive(s) or press <N> to return to the utility main menu.

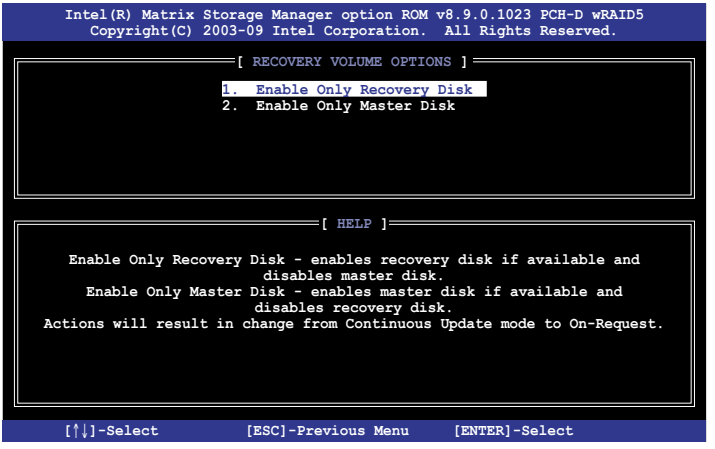
6.3.5 Recovery Volume Options

If you have created a recovery set, you can configure more recovery set options following the descriptions in the section.

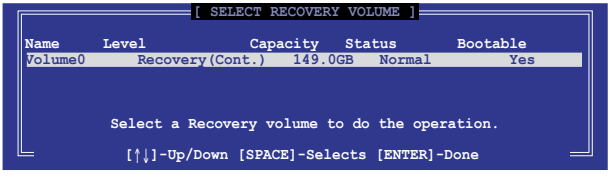
See section **6.3.2 Creating a Recovery set** to create a recovery set before continue.

To configure a recovery set

1. From the utility main menu, select **4. Recovery Volume Options** and press <Enter>. The following screen appears.


Intel(R) Matrix Storage Manager option ROM v8.9.0.1023 PCH-D wRAID5
Copyright(C) 2003-09 Intel Corporation. All Rights Reserved.
[RECOVERY VOLUME OPTIONS]
1. Enable Only Recovery Disk
2. Enable Only Master Disk
[HELP]
Enable Only Recovery Disk - enables recovery disk if available and disables master disk.
Enable Only Master Disk - enables master disk if available and disables recovery disk.
Actions will result in change from Continuous Update mode to On-Request.
[↑↓]-Select
[ESC]-Previous Menu
[ENTER]-Select

2. Use the up/down arrow key to select the option you want, and then press <ENTER>. The **SELECT RECOVERY VOLUME** screeen appears.


[SELECT RECOVERY VOLUME]
Name Level Capacity Status Bootable
Volume0 Recovery(Cont.) 149.0GB Normal Yes
Select a Recovery volume to do the operation.
[↑↓]-Up/Down [SPACE]-Selects [ENTER]-Done

3. Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection and return to the utility main menu.

6.3.6 Exiting the Intel® Matrix Storage Manager

To exit the utility

1. From the utility main menu, select **5. Exit**, and then press <Enter>. The following warning message appears.

2. Press <Y> to exit or press <N> to return to the utility main menu.

6.3.7 Rebuilding the RAID

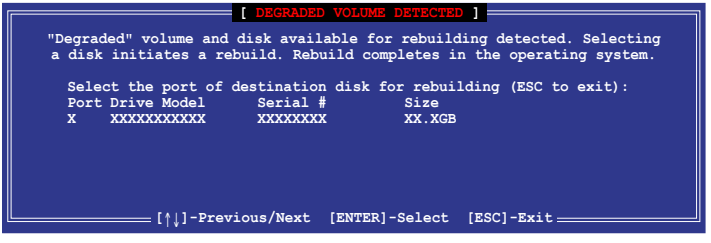
This option is only for the RAID 1 set.

Rebuilding the RAID with other non-RAID disk

If any of the SATA hard disk drives included in the RAID 1 array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You can rebuild the RAID array with other installed non-RAID disks.

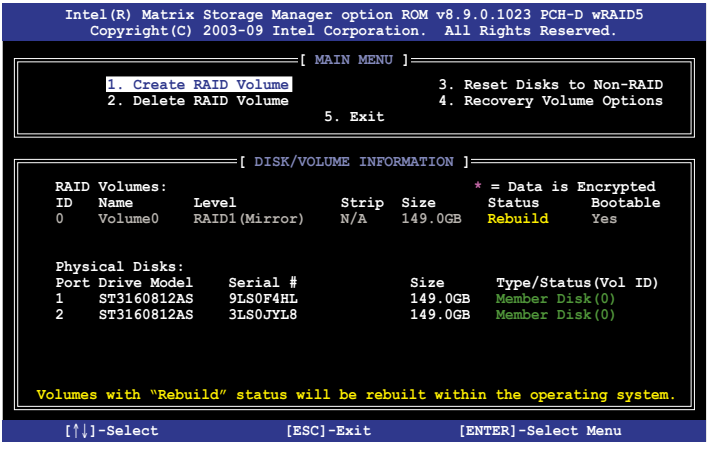
To rebuild the RAID with other non-RAID disk:

1. At the prompt, press <Ctrl> + <I> to enter the Intel Matrix Storage Manager option ROM utility.
2. If there is a non-RAID SATA Hard Disk available, the utility will prompt to rebuild the RAID. Press <Enter>, and then use up/down arrow keys to select the destination disk or press <ESC> to exit.


[DEGRADED VOLUME DETECTED]
"Degraded" volume and disk available for rebuilding detected. Selecting a disk initiates a rebuild. Rebuild completes in the operating system.
Select the port of destination disk for rebuilding (ESC to exit):
Port Drive Model Serial # Size
X XXXXXXXXXXX XXXXXXXX XX.XGB
[↑↓]-Previous/Next [ENTER]-Select [ESC]-Exit

Select a destination disk with the same size as the original hard disk.

3. The utility immediately starts rebuilding after the disk is selected. The status of the degraded RAID volume is changed to **"Rebuild"**.


Intel(R) Matrix Storage Manager option ROM v8.9.0.1023 PCH-D wRAID5
Copyright(C) 2003-09 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Recovery Volume Options
5. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
* = Data is Encrypted
ID Name Level Strip Size Status Bootable
0 Volume0 RAID1(Mirror) N/A 149.0GB Rebuild Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
1 ST3160812AS 9LS0F4HL 149.0GB Member Disk(0)
2 ST3160812AS 3LS0JYL8 149.0GB Member Disk(0)
Volumes with "Rebuild" status will be rebuilt within the operating system.
[↑↓]-Select
[ESC]-Exit
[ENTER]-Select Menu

4. Exit Intel Matrix Storage Manager and reboot the system.
5. Select **Start > Programs > Intel Matrix Storage > Intel Matrix Storage Console** or click the **Intel Matrix Storage Manager** tray icon to load the Intel Matrix Stroage Manager utility.
6. From the **View** menu, select **Advanced Mode** to display the details of the Intel Matrix Storage Console.
7. From the **Volumes view** option, select **RAID volume** to view the rebuilding status. When finished, the status is changed to "**Normal**".

Rebuilding the RAID with a new hard disk

If any of the SATA hard disk drives included in the RAID array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You may replace the disk drive and rebuild the RAID array.

To rebuild the RAID with a new hard disk:

1. Remove the failed SATA hard disk and install a new SATA hard disk of the same specification into the same SATA Port.

Select a destination disk with the same size as the original hard disk.

2. Reboot the system and then follow the steps in section **Rebuilding the RAID with other non-RAID disk** on page 6-31.

6.3.8 Setting the Boot array in the BIOS Setup Utility

You can set the boot priority sequence in the BIOS for your RAID arrays when creating multi-RAID using the Intel® Matrix Storage Manager.

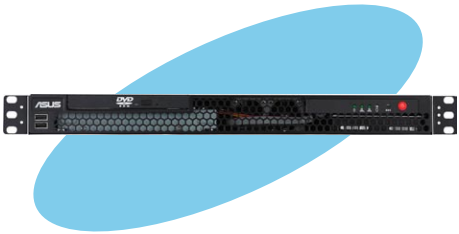
To set the boot array in the BIOS:

Set at least one of the arrays bootable to boot from the hard disk.

1. Reboot the system and press <Del> to enter the BIOS setup utility during POST.
2. Go to the **Boot** menu and select the option **Boot Device Priority**.
3. Use up/down arrow keys to select the boot priority and press <Enter>. See section **5.7.1 Boot Device Priority** for details.
4. From the **Exit** menu, select **Exit & Save Changes**, then press <Enter>.
5. When the confirmation window appears, select **OK**, then press <Enter>.

Chapter 7

This chapter provides instructions for installing the necessary drivers for different system components.



Driver installation

7.1 RAID driver installation

After creating the RAID sets for your server system, you are now ready to install an operating system to the independent hard disk drive or bootable array. This part provides instructions on how to install the RAID controller drivers during OS installation.

7.1.1 Creating a RAID driver disk

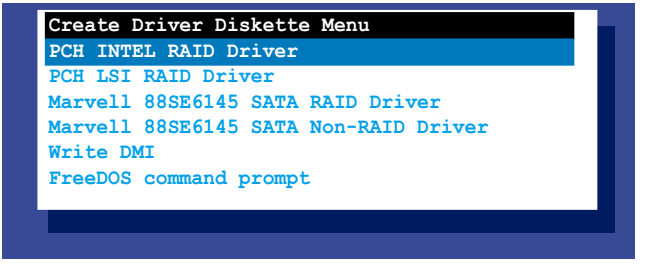
The system does not include a floppy drive. You have to use a USB floppy drive when creating a SATA RAID driver disk.

If you have created RAID sets with the LSI Software RAID configuration utility, the boot priority of the SATA optical disk drive has to be manually adjusted. Otherwise, the system will not boot from the connected SATA ODD.

A floppy disk with the RAID driver is required when installing Windows® or Red Hat® Enterprise operating system on a hard disk drive that is included in a RAID set. You can create a RAID driver disk in DOS (using the Makedisk application in the support DVD).

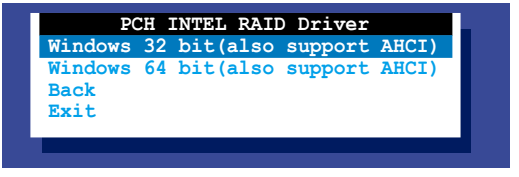
To create a RAID driver disk in DOS environment

1. Place the motherboard support DVD in the optical drive.
2. Restart the computer, and then enter the BIOS Setup.
3. Select the optical drive as the first boot priority to boot from the support DVD. Save your changes, and then exit the BIOS Setup.
4. Restart the computer. The Makedisk menu appears.

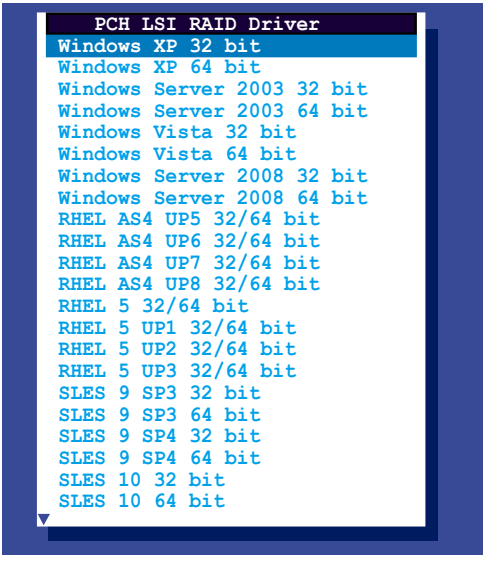


5. Use the arrow keys to select the type of RAID driver disk you want to create and press <Enter> to enter the sub-menu.

PCH INTEL RAID Driver



PCH LSI RAID Driver


PCH LSI RAID Driver
Windows XP 32 bit
Windows XP 64 bit
Windows Server 2003 32 bit
Windows Server 2003 64 bit
Windows Vista 32 bit
Windows Vista 64 bit
Windows Server 2008 32 bit
Windows Server 2008 64 bit
RHEL AS4 UP5 32/64 bit
RHEL AS4 UP6 32/64 bit
RHEL AS4 UP7 32/64 bit
RHEL AS4 UP8 32/64 bit
RHEL 5 32/64 bit
RHEL 5 UP1 32/64 bit
RHEL 5 UP2 32/64 bit
RHEL 5 UP3 32/64 bit
SLES 9 SP3 32 bit
SLES 9 SP3 64 bit
SLES 9 SP4 32 bit
SLES 9 SP4 64 bit
SLES 10 32 bit
SLES 10 64 bit

6. Locate the RAID driver and place a blank, high-density floppy disk to the floppy disk drive.
7. Press <Enter>.
8. Follow screen instructions to create the driver disk.

To create a RAID driver disk in Windows® environment

1. Start Windows®.
2. Place the motherboard support DVD into the optical drive.
3. Go to the **Make Disk** menu, and then select the type of RAID driver disk you want to create.
4. Insert a floppy disk into the floppy disk drive.
5. Follow succeeding screen instructions to complete the process.

Write-protect the floppy disk to avoid computer virus infection.

To create a RAID driver disk in Red Hat® Enterprise Linux server environment

1. Insert a blank formatted high-density floppy disk to the floppy disk drive.
2. Type **`dd if=XXX.img of=/dev/fd0`** to decompress the file into the floppy disk from the following path in the support DVD:

   For LSI MegaRAID Driver

   \Drivers\PCH LSI RAID\Driver\makedisk\Linux

3. Eject the floppy disk.

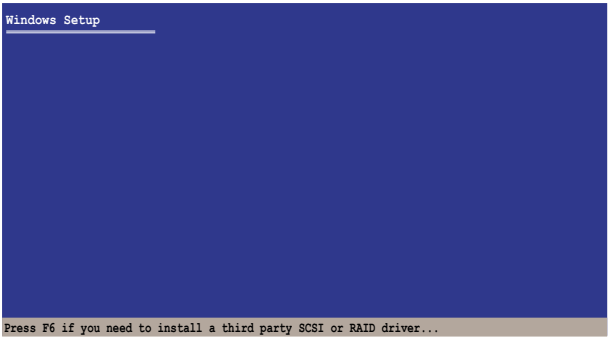
7.1.2 Installing the RAID controller driver

Windows® Server OS

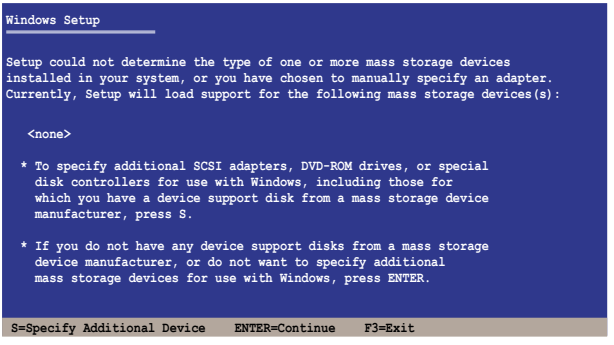
During Windows® Server OS installation

To install the RAID controller driver when installing Windows® Server OS:

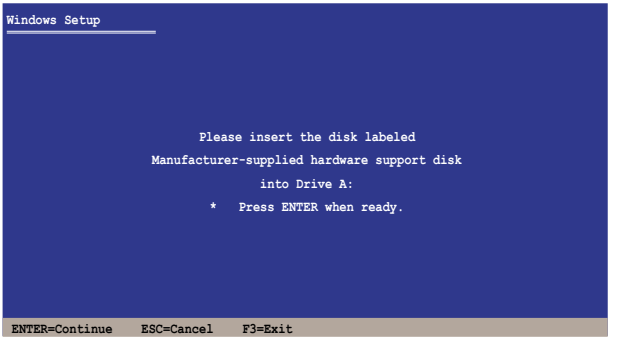
1. Boot the computer using the Windows® Server installation DVD. The Windows® Server OS Setup starts.



2. Press <F6> when the message “Press F6 if you need to install a third party SCSI or RAID driver...” appears at the bottom of the screen.
3. When prompted, press <S> to specify an additional device.


Windows Setup
Setup could not determine the type of one or more mass storage devices
installed in your system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices(s):
<none>
* To specify additional SCSI adapters, DVD-ROM drives, or special
disk controllers for use with Windows, including those for
which you have a device support disk from a mass storage device
manufacturer, press S.
* If you do not have any device support disks from a mass storage
device manufacturer, or do not want to specify additional
mass storage devices for use with Windows, press ENTER.
S=Specify Additional Device ENTER=Continue F3=Exit

4. Insert the RAID driver disk you created earlier to the floppy disk drive, then press <Enter>.



5. Select the RAID controller driver you need from the list, then press <Enter>.
6. The Windows® Setup loads the RAID controller drivers from the RAID driver disk. When prompted, press <Enter> to continue installation.
7. Setup then proceeds with the OS installation. Follow screen instructions to continue.

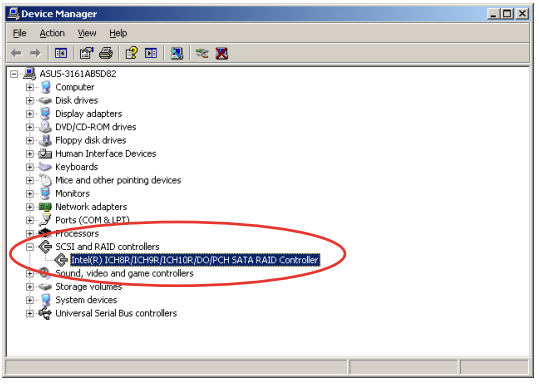
To an existing Windows® Server OS

To install the RAID controller driver on an existing Windows® Server OS

1. Restart the computer, and then log in with **Administrator** privileges.
2. Windows® automatically detects the RAID controller and displays a **New Hardware Found** window. Click **Cancel**.
3. Right-click the **My Computer** icon on the Windows® desktop, and then select **Properties** from the menu.
4. Click the **Hardware** tab, and then click the **Device Manager** button to display the list of devices installed in the system.
5. Right-click the **RAID controller** item, then select **Properties**.
6. Click the **Driver** tab, and then click the **Update Driver** button.
7. The **Upgrade Device Driver Wizard** window appears. Click **Next**.
8. Insert the RAID driver disk you created earlier to the floppy disk drive.
9. Select the option **Install the software automatically (Recommended)**, and then click **Next**.
10. The wizard searches the RAID controller drivers. When found, click **Next** to install the drivers.
11. Click **Finish** after the driver installation is done.

To verify the RAID controller driver installation:

1. Right-click the **My Computer** icon on the Windows® desktop, and then select **Properties** from the menu.
2. Click the **Hardware** tab, and then click the **Device Manager** button.
3. Click the "+" sign before the item **SCSI and RAID controllers**, and then the **Intel(R) ICH8R/ICH9R/ICH10R/DO/PCH SATA RAID Controller** item should appear.



The screen differs based on the controller.

4. Right-click the **RAID controller** driver item, and then select **Properties** from the menu.
5. Click the **Driver** tab, and then click the **Driver Details** button to display the RAID controller drivers.
6. Click **OK** when finished.

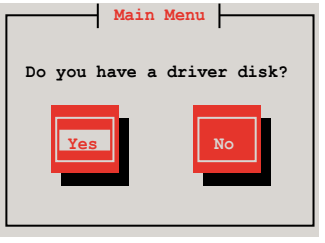
Red Hat® Enterprise Linux OS 4.7/4.8

To install the RAID controller driver when installing Red Hat® Enterprise OS:

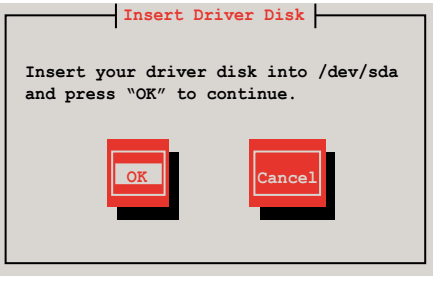
1. Boot the system from the Red Hat® OS installation CD.
2. At the **boot:**, type **linux dd nostorage**.
3. Press <Enter>.

```
-  To install or upgrade in graphical mode, press the <ENTER> key.
-  To install or upgrade in text mode, type: linux text <ENTER>.
-  Use the function keys listed below for more information.
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: linux dd nostorage
```

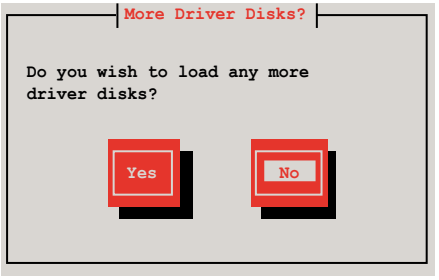
4. Select **Yes** using the <Tab> key when asked if you have the driver disk, then press <Enter>.



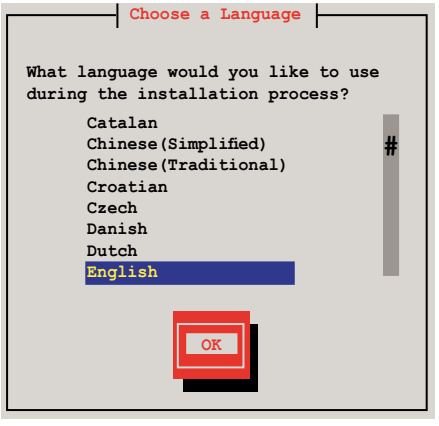
5. Press <Enter> to continue.



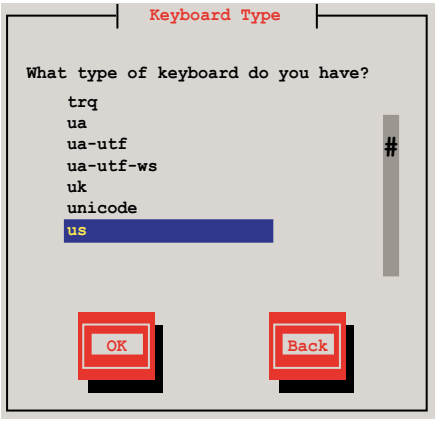
6. Select **No** and press <Enter> to continue.



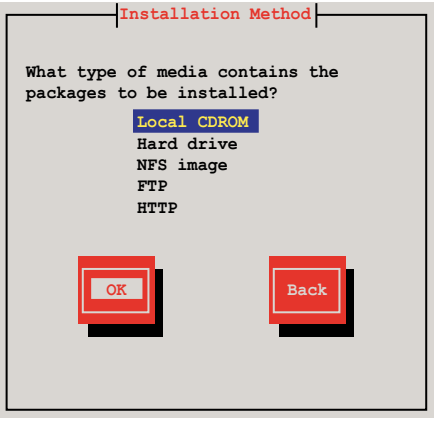
7. Select your desired language and press <Enter> to continue.



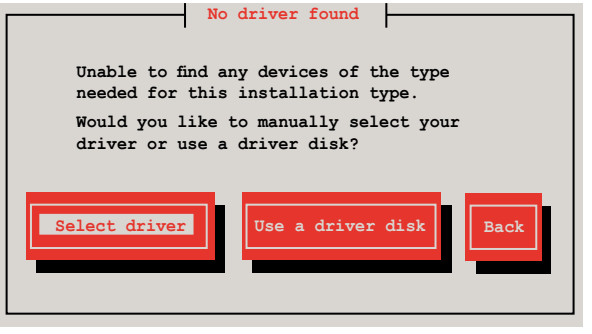
8. Select your keyboard type and press <Enter> to continue.



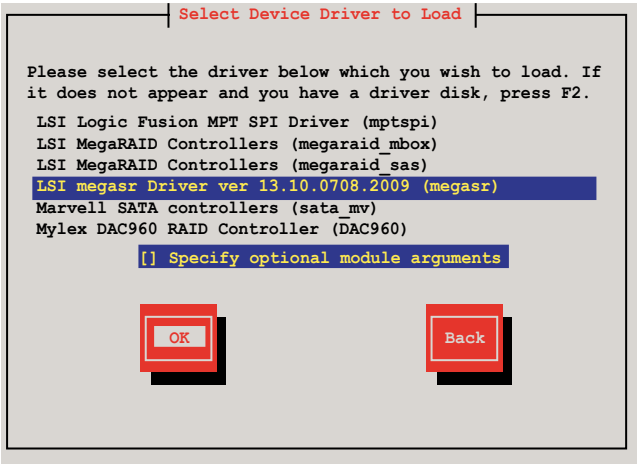
9. Select the media and press <tab> to select **OK**. Press<Enter> to continue.



10. Select the media and press <tab> to select **OK**. Press <Enter> to continue.

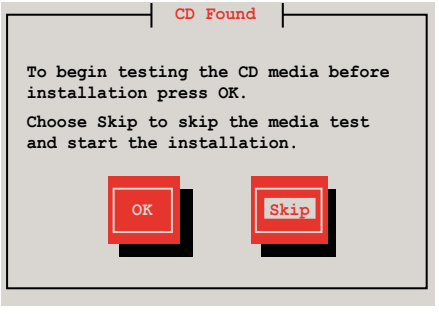

No driver found
Unable to find any devices of the type needed for this installation type.
Would you like to manually select your driver or use a driver disk?
Select driver
Use a driver disk
Back

11. Scroll down to locate the driver and press <Enter> to continue.


Select Device Driver to Load
Please select the driver below which you wish to load. If it does not appear and you have a driver disk, press F2.
LSI Logic Fusion MPT SPI Driver (mptspi)
LSI MegaRAID Controllers (megaraid_mbox)
LSI MegaRAID Controllers (megaraid_sas)
LSI megasr Driver ver 13.10.0708.2009 (megasr)
Marvell SATA controllers (sata_mv)
Mylex DAC960 RAID Controller (DAC960)
[] Specify optional module arguments
OK
Back

The driver version may vary with time and model. Select LSI Mega Software RAID driver (**LSI megasr Driver**) all the time.

12. Select **Skip** and press <Enter> to continue.


CD Found
To begin testing the CD media before installation press OK.
Choose Skip to skip the media test and start the installation.
OK
Skip

13. Select **Done** and press <Enter> to continue.

Devices
The following devices have been found on your system.
Intel Pro/1000 (e1000e)
LSI megasr Driver ver 13.10.0708.2009 (megasr)
USB Mass Storage driver for Linux (usb-storage)
Done
Add Device

The displayed devices may vary with models and systems.

14. Follow the onscreen instructions to finish installing the RedHat operating system.

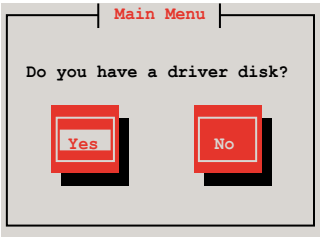
Red Hat® Enterprise Linux OS 5.0

To install the RAID controller driver when installing Red Hat® Enterprise OS:

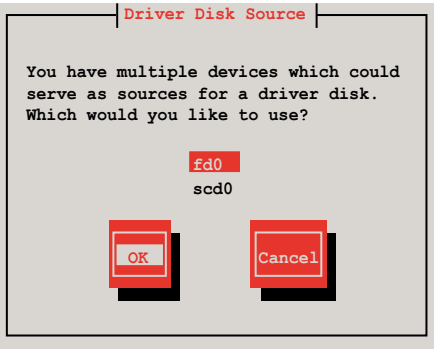
1. Boot the system from the Red Hat® OS installation CD.
2. At the **boot:**, type **linux dd noprobe=ata[n]**. The number of ata varies with the hard disk drive number you have when building a RAID set. For example, if you want to build a RAID set with 6 hard disk drives, type command line: linux dd noprobe=ata1 noprobe=ata2 noprobe=ata3 noprobe=ata4 noprobe=ata5 noprobe=ata6.
3. Press <Enter>.

```
-  To install or upgrade in graphical mode, press the <ENTER> key.
-  To install or upgrade in text mode, type: linux text <ENTER>.
-  Use the function keys listed below for more information.
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: linux dd noprobe=ata[n]
```

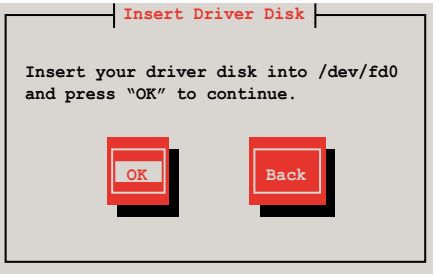
4. Select **Yes** using the <Tab> key when asked if you have the driver disk, then press <Enter>.



5. Select **fd0** using the <Tab> key when asked to select the driver disk source. Press <Tab> to move the cursor to **OK**, then press <Enter>.

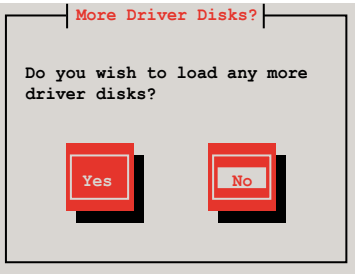

Driver Disk Source
You have multiple devices which could serve as sources for a driver disk. Which would you like to use?
fd0
scd0
OK
Cancel

6. Insert the Red Hat® Enterprise RAID driver disk to the floppy disk drive, select **OK**, then press <Enter>.



The drivers for the RAID card are installed to the system.

7. When asked if you will load additional RAID controller drivers, select **No**, then press <Enter>.



8. Follow the onscreen instructions to finish the OS installation.
9. If you install RHEL AS5, when the installation is completed, DO NOT click **Reboot**. Press <Ctrl> + <Alt> + <F2> to switch to the command-line interface from graphic user interface.
10. Type the following commands when using a USB floppy.

```
cat /proc/partitions
```

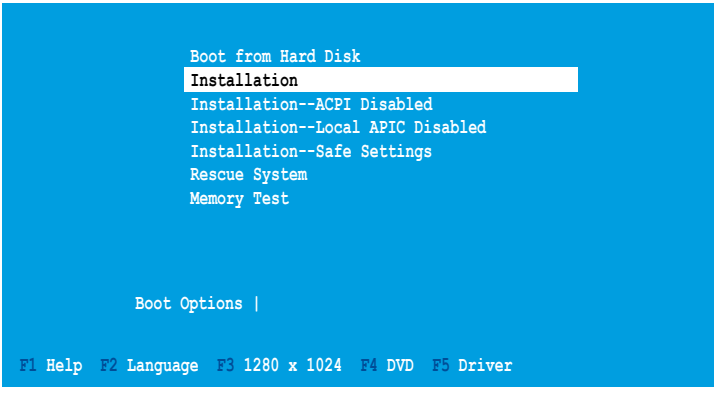
Write down the **Major** and **Minor** number before **sdb** for later use.

```
mknod /dev/sdb b [major number] [minor number]
mkdir /mnt/driver
mount /dev/sdb /mnt/driver
cd /mnt/driver
sh replace_ahci.sh
reboot
```

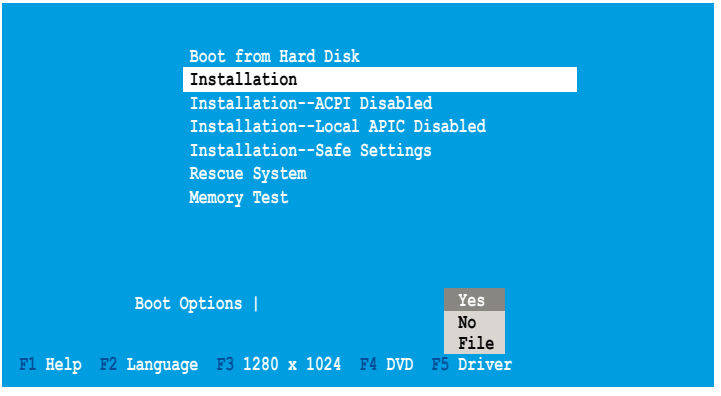
SUSE Linux OS

To install the RAID controller driver when installing SUSE Linux Enterprise Server OS:

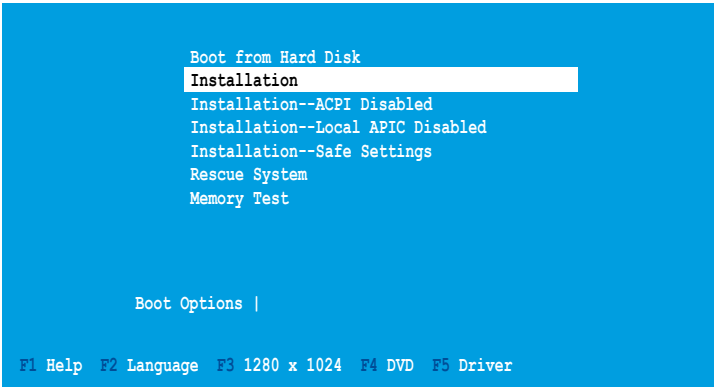
1. Boot the system from the SUSE OS installation CD.
2. Use the arrow keys to select **Installation** from the **Boot Options** menu.



3. Press <F5>, then select **Yes** from the menu. Press <Enter>.

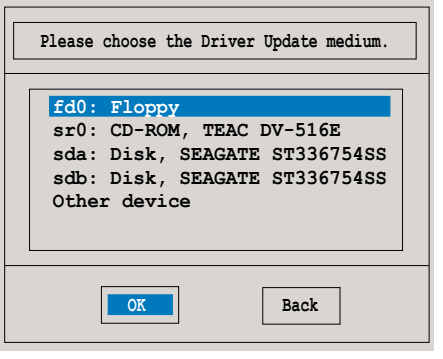


4. Insert the RAID driver disk to the floppy disk drive. Make sure that **Installation** from the **Boot Options** menu is selected, then press <Enter>.



If you install SLES 10, type **brokenmodules=ahci** after **Boot Options** and press **Enter** to continue.

5. When below screen appears, select the floppy disk drive (fd0) as the driver update medium. Select **OK**, then press <Enter>.



The drivers for the RAID controller are installed to the system.

7.2 Intel® chipset device installation

This section provides instructions on how to install the Plug and Play components for the Intel® chipset on the system.

You need to manually install the Intel® chipset software on a Windows Server operating system. To install the Intel® chipset device software:

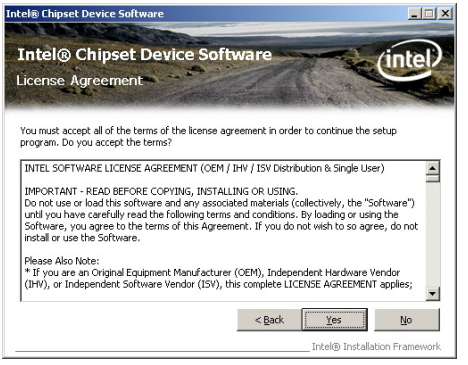
1. Restart the computer, then log on with **Administrator** privileges.
2. Insert the motherboard/system support DVD to the optical drive. The support DVD automatically displays the **Drivers** menu if Autorun is enabled in your computer.
3. Click the item **Intel Chipset Device Software** from the menu.

ASUS Server 34x0 Series Support DVD - Windows Server 2003 32 bit
Drivers
Utilities
Make Disk
Contact
Drivers
Please select items on the right side.
ASUS InstAll - Drivers Installation Wizard
Intel Chipset Device Software
Intel Network Connections Software
ASPEED AST2050 Display Driver
Intel PRO/1000 Gigabit Adapters Driver

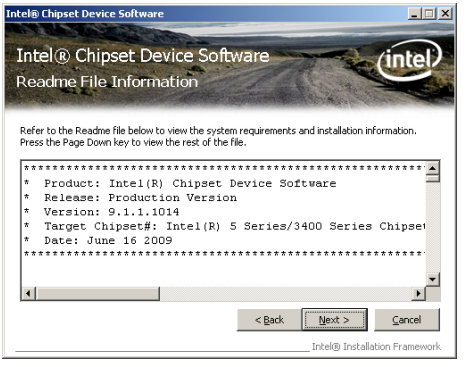
4. The **Intel(R) Chipset Device Software** window appears. Click **Next** to start installation.

Intel® Chipset Device Software
Intel® Chipset Device Software
intel
Welcome to the Setup Program
This setup program will install the Intel® Chipset Device Software onto this computer. It is strongly recommended that you exit all programs before continuing.
< Back
Next >
Cancel
Intel® Installation Framework

5. Select **Yes** to accept the terms of the **License Agreement** and continue the process.


Intel® Chipset Device Software
Intel® Chipset Device Software
License Agreement
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
< Back
Yes
No
Intel® Installation Framework

6. Read the **Readme File Information** and press **Next** to continue the installation.


Intel® Chipset Device Software
Intel® Chipset Device Software
Readme File Information
Refer to the Readme file below to view the system requirements and installation information.
Press the Page Down key to view the rest of the file.
* Product: Intel(R) Chipset Device Software
* Release: Production Version
* Version: 9.1.1.1014
* Target Chipset#: Intel(R) 5 Series/3400 Series Chipset
* Date: June 16 2009
< Back
Next >
Cancel
Intel® Installation Framework

7. After completing the installation, click **Finish** to complete the setup process.

Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Is Complete
The setup program successfully installed the Intel® Chipset Device Software onto this computer.
Click Finish to complete the setup process.
Finish
Intel® Installation Framework

7.3 LAN driver installation

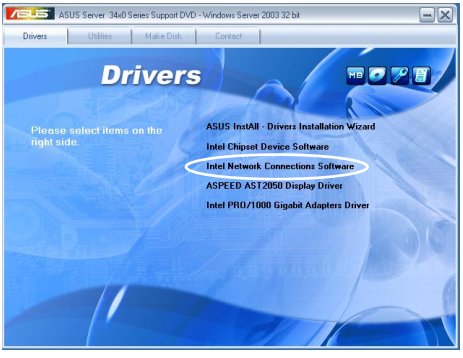
This section provides instructions on how to install the Intel® Gigabit LAN controller drivers on a Windows® Server OS.

To install the LAN controller drivers

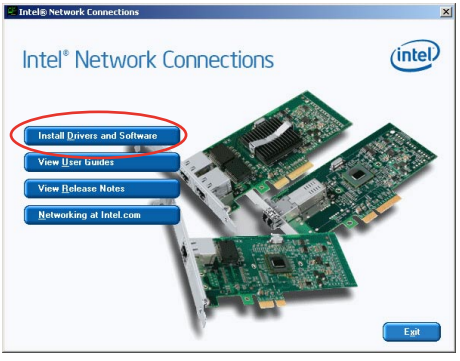
1. Restart the computer, and then log on with Administrator privileges.
2. Insert the motherboard/system support DVD to the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer.

- Windows® automatically detects the LAN controllers and displays a New Hardware Found window. Click **Cancel** to close this window.
- If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

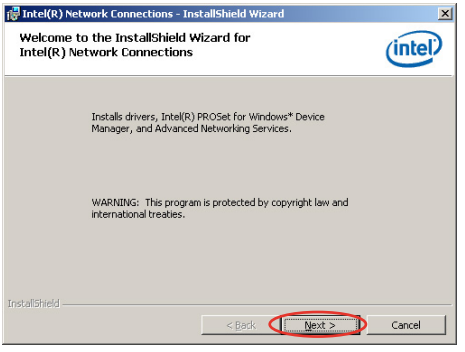
3. Click the **Intel Network Connections Software** to begin installation.


ASUS Server 34x0 Series Support DVD - Windows Server 2003 32 bit
Drivers
Utilities
Make Disk
Contact
Drivers
Please select items on the right side.
ASUS InstAll - Drivers Installation Wizard
Intel Chipset Device Software
Intel Network Connections Software
ASPEED AST2050 Display Driver
Intel PRO/1000 Gigabit Adapters Driver

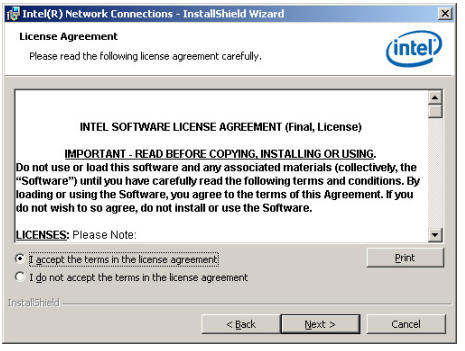
4. Click **Install Drivers and Software** option to begin installation.



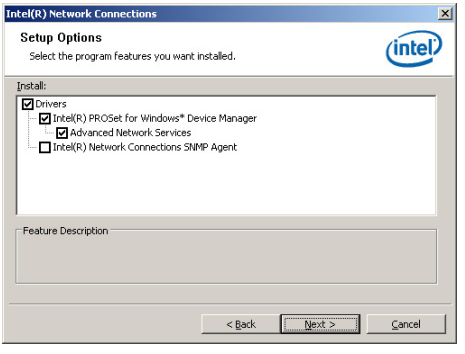
5. Click **Next** when the **Intel(R) Network Connections–InstallShield Wizard** window appears.


Intel(R) Network Connections - InstallShield Wizard
Welcome to the InstallShield Wizard for Intel(R) Network Connections
Installs drivers, Intel(R) PROSet for Windows* Device Manager, and Advanced Networking Services.
WARNING: This program is protected by copyright law and international treaties.
InstallShield
< Back
Next >
Cancel

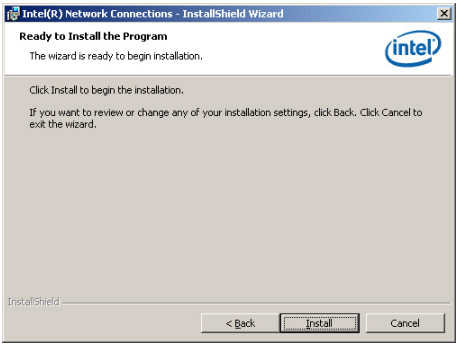
6. Toggle **I accept the terms in the license agreement** and click **Next** to continue.


Intel(R) Network Connections - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT (Final, License)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
LICENSES: Please Note:
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

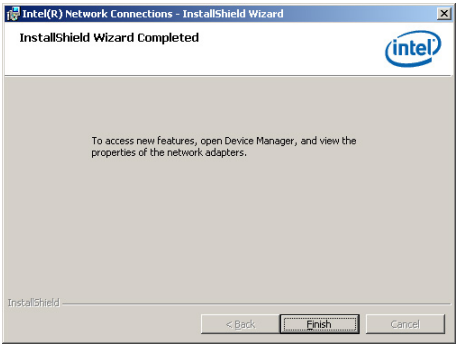
7. Click the **Intel(R) PROSet for Windows Device Manager** box, and then click **Next** to start the installation.



8. Follow the screen instructions to complete installation.


Intel(R) Network Connections - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

9. When finished, press **Finish** to continue.


Intel(R) Network Connections - InstallShield Wizard
InstallShield Wizard Completed
To access new features, open Device Manager, and view the properties of the network adapters.
InstallShield
< Back
Finish
Cancel

7.4 VGA driver installation

This section provides instructions on how to install the Aspeed® Video Graphics Adapter (VGA) driver.

You need to manually install the Aspeed® VGA driver on a Windows® Server operating system.

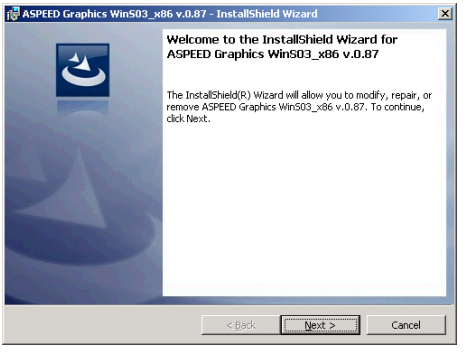
To install the Aspeed® VGA driver

1. Restart the computer, then log on with Administrator privileges.
2. Insert the motherboard/system support DVD to the optical drive. The support DVD automatically displays the Drivers menu if Autorun is enabled in your computer.

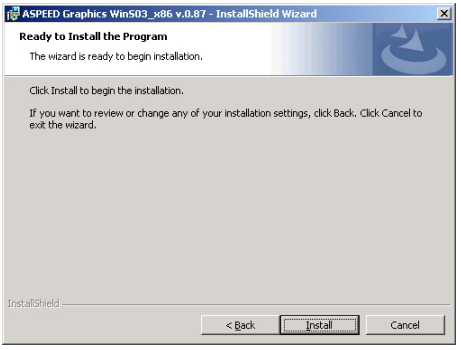
   The **Drivers** menu if Autorun is enabled in your computer.

ASUS Server 34x0 Series Support DVD - Windows Server 2003 32 bit
Drivers
Utilities
Make Disk
Contact
Drivers
Please select items on the right side.
ASUS InstAll - Drivers Installation Wizard
Intel Chipset Device Software
Intel Network Connections Software
ASPEED AST2050 Display Driver
Intel PRO/1000 Gigabit Adapters Driver

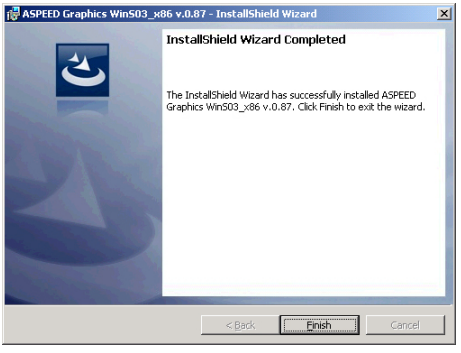
3. Click **Next** to start the installation.


ASPEED Graphics WinS03_x86 v.0.87 - InstallShield Wizard
Welcome to the InstallShield Wizard for ASPEED Graphics WinS03_x86 v.0.87
The InstallShield(R) Wizard will allow you to modify, repair, or remove ASPEED Graphics WinS03_x86 v.0.87. To continue, click Next.
< Back
Next >
Cancel

4. Click **Install** to update the VGA driver.


ASPEED Graphics WinS03_x86 v.0.87 - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

5. When the installation completes, click **Finish** to restart your computer before using the program.


ASPEED Graphics WinS03_x86 v.0.87 - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed ASPEED Graphics WinS03_x86 v.0.87. Click Finish to exit the wizard.
< Back
Finish
Cancel

7.5 Management applications and utilities installation

The support DVD that came with the motherboard package contains the drivers, management applications, and utilities that you can install to avail all motherboard features.

The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website (www.asus.com) for updates.

7.5.1 Running the support DVD

Place the support DVD to the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer.

If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

7.5.2 Drivers menu

The Drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to activate the devices.

The screen display and driver options vary under different operating system versions.

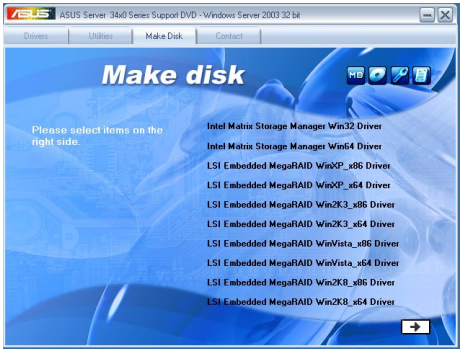
ASUS Server 34x0 Series Support DVD - Windows Server 2003 32 bit
Drivers
Utilities
Make Disk
Contact
Drivers
Please select items on the right side.
ASUS InstAll - Drivers Installation Wizard
Intel Chipset Device Software
Intel Network Connections Software
ASPEED AST2050 Display Driver
Intel PRO/1000 Gigabit Adapters Driver

7.5.3 Utilities menu

The Utilities menu displays the software applications and utilities that the motherboard supports. Click an item to install.

7.5.4 Make disk menu

The Make disk menu contains items to create the Intel ICH10R and LSI MegaRAID driver disks.


ASUS Server 34x0 Series Support DVD - Windows Server 2003 32 bit
Drivers
Utilities
Make Disk
Contact
Make disk
Please select items on the right side.
Intel Matrix Storage Manager Win32 Driver
Intel Matrix Storage Manager Win64 Driver
LSI Embedded MegaRAID WinXP_x86 Driver
LSI Embedded MegaRAID WinXP_x64 Driver
LSI Embedded MegaRAID Win2K3_x86 Driver
LSI Embedded MegaRAID Win2K3_x64 Driver
LSI Embedded MegaRAID WinVista_x86 Driver
LSI Embedded MegaRAID WinVista_x64 Driver
LSI Embedded MegaRAID Win2K8_x86 Driver
LSI Embedded MegaRAID Win2K8_x64 Driver

7.5.5 Contact information

Click the Contact tab to display the ASUS contact information. You can also find this information on the inside front cover of this user guide.